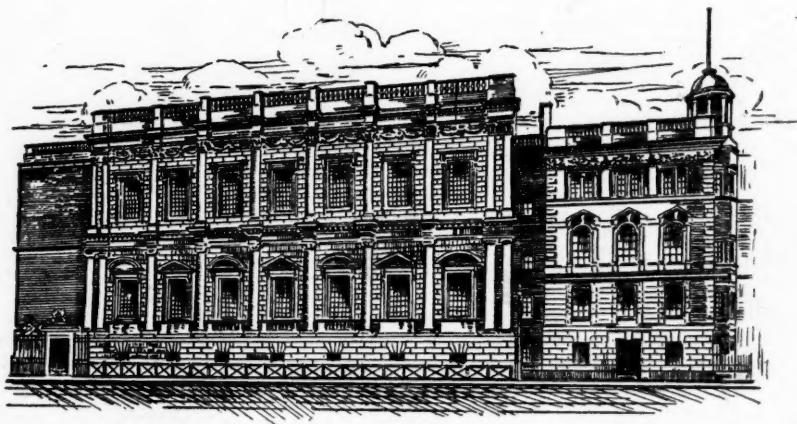


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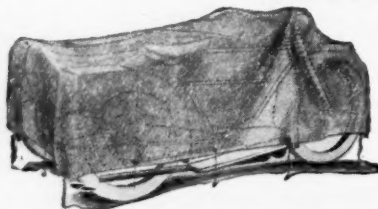
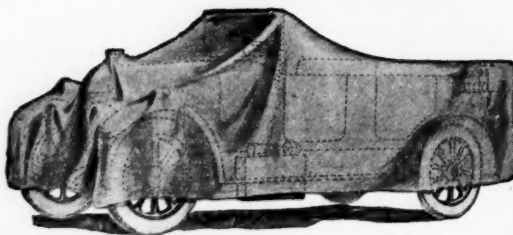
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SECRETARY'S NOTES.

FEBRUARY, 1926.

I.—Death of H.M. Queen Alexandra.

The following letter was sent by the Council, viz. :—

" November 21st, 1925.

The Private Secretary of
HIS MAJESTY KING GEORGE V,
Buckingham Palace, S.W.

MY LORD,—The Council and Members of the Royal United Service Institution desire to record their humble duty to His Majesty, and to state their profound regret at the death of Her Majesty the Queen Mother, also to express their deep sympathy with His Majesty the King and the Royal family in the loss they have sustained.

The Council record with very great pleasure the many visits which Her Majesty the late Queen Alexandra made to the Institution's Museum, and the interest she displayed in its activities.

We are,

Your Lordship's obedient Servants,
(Sgd.) H. H. BRUCE, Vice-Admiral,
Acting Chairman of the Council.
(Sgd.) ARTHUR LEETHAM, Lieut.-Colonel,
Secretary."

II.—H.R.H. The Prince of Wales.

The following letter was sent by the Council to H.R.H. The Prince of Wales on his return from his recent tour abroad, viz. :—

" 17th October, 1925.

The Private Secretary,
H.R.H. THE PRINCE OF WALES, K.G., K.T., G.C.S.I., G.C.M.G.,
G.C.I.E., G.C.V.O., G.B.E., M.C.
York House, S.W.1.

SIR,—The Council and Members of the Royal United Service Institution beg to offer their cordial greetings to His Royal Highness The Prince of Wales, their Vice-Patron, on his return to England.

The also beg that His Royal Highness will accept their respectful congratulations on the completion of yet another great service to the Empire.

We have the honour to be, Sir,
Your obedient Servants,

(Sgd.) HORNE, General,
Chairman.
(Sgd.) ARTHUR LEETHAM, Lieut.-Colonel,
Secretary."

III.—Council.

The following Members of the Council having completed three years' service retire at the Anniversary Meeting:—General Sir J. A. L. Haldane G.C.M.G., K.C.B. D.S.O.; General Sir Ivor Maxse K.C.B. C.V.O. D.S.O.; Major-General H. F. Thuillier C.B. C.M.G.; Colonel C. H. Colvin C.B. D.S.O.; Colonel A. S. Bates D.S.O. T.D.; and Captain Lord Tredegar C.B.E. F.S.A. R.N.V.R., A.D.C. to H.M. The King; all of whom offer themselves for re-election; and in addition Field-Marshal The Viscount Allenby, G.C.B., G.C.M.G., has been duly nominated.

The following vacancies on the Council will be filled at that meeting, in accordance with Chap. V, of the Byelaws:—Regular Army, 3; Militia, 1; Territorial Army, 1; Royal Naval Volunteer Reserve, 1.

IV.—Anniversary Meeting.

The Anniversary Meeting will be held on Tuesday, 2nd March, 1926, at 3.30 p.m. The Council will present their Annual Report and Accounts for 1925, the election to vacancies on the Council will take place, and the result of the Gold Medal Essays will be announced. The following alterations to the Bye-laws will be submitted. Chapter III, para. 5, to read: "Members joining after 30th June, 1926, pay as follows: (1) Annual Member, £1 5s.; Entrance Fee, £2 2s. The present Annual Member's Subscription to be £1 5s. and come into force 1st January, 1927. (2) Life Members, £20." Chapter III, para. 9, delete "Members of the United Service Institution of India for six months on payment of five shillings."

The Chair will be taken by the Vice-Chairman of the Council, Vice-Admiral Sir Henry Bruce, K.C.B., M.V.O.

(See also VII.—Finance.)

V.—Membership.

The Council beg to report that during the past year 355 Officers joined the Institution (against 401 in 1924). There were 146 withdrawals and 94 deaths (of which 28 were Life Members), making an increase of 115 on the year.

The Council trust that Members will do their utmost to introduce new members during the coming year.

The details of Members joining were as follows:—

Regular Army (all arms)	..	..	..	..	..	250
Royal Navy	..	..	..	..	..	46
Royal Air Force	..	..	..	..	..	26
Territorial Army (including Yeomanry)	..	..	..	..	..	17
Royal Marines	..	..	..	..	..	10
Royal Naval Reserve	..	..	..	..	..	4
Overseas Forces	..	..	..	..	..	2
						<hr/> 355

The total number of Members on 1st January, 1926, was 5,927.

VI.—Officers Joined.

The following Officers joined the Institution during the months of November, December and January, viz. :—

Second-Lieutenant E. E. D. Hedley, 5th Bn. London Regiment (T.A.).
Lieutenant H. S. Hoseason, Manchester Regiment.
Captain K. D. W. Macpherson, R.N.
Major H. G. ffiske, T.F.R.
Lieutenant G. F. Mandeville, R.N.
Major H. E. Ravenshaw, Royal Marines.
Captain C. E. Hare, M.C., R.A.
Lieutenant J. T. Milner, Worcestershire Regiment.
Lieutenant M. H. Wallace, Highland Light Infantry.
Captain W. G. H. Wells, I.A.
Captain E. Wood, M.C., I.A.
Captain I. A. S. H. Monro, Queen's Own Cameron Highlanders.
Captain O. T. Durrant, I.A.
Captain R. H. F. Duckworth, M.C., R.E.
Captain A. T. Coltart, M.C., The Cameronians.
Surgeon Lieut.-Colonel F. Blake-Campbell, V.D., late R.A.M.C. (T.A.).
Lieutenant C. E. L. Harris, Duke of Cornwall's Light Infantry.
Commander H. H. Bousfield, R.N.
Captain H. N. Irwin, M.C., I.A.
Lieutenant N. D. Stevenson, The Black Watch.
Captain I. MacA. Stewart, O.B.E., M.C., Argyll & Sutherland Highlanders.
Lieutenant R. J. Maunsell, Royal Tank Corps.
Lieutenant G. O'C. Rogers, Durham Light Infantry.
Lieutenant J. C. Clouston, R.N.
Lieutenant J. R. Trowsell, Duke of Cornwall's Light Infantry.
Major J. H. Edmond, D.S.O., R.A.
Lieutenant H. W. Spurrell, Somerset Light Infantry.
Flight-Lieutenant C. R. Strudwick, R.A.F.
Lieutenant B. E. F. Hall, late 4th Bn. East Surrey Regiment (S.R.).
Lieutenant D. A. L. Wade, M.C., Royal Corps of Signals.
Lieutenant R. G. Coulson, King's Royal Rifle Corps.
Lieutenant V. C. Ritchie, R.H.A.
Captain C. B. Stephenson, North Staffordshire Regiment.
Captain A. E. H. Sayers, Duke of Wellington's Regiment.
Lieutenant J. F. Paterson, R.A.
Lieutenant P. G. C. Peddie, Queen's Own Cameron Highlanders.
Major G. M. Routh, C.B.E., D.S.O., R.A.
Flight-Lieutenant E. J. D. Townesend, R.A.F.
Captain R. Evelyn-Smith, Wiltshire Regiment.
Lieutenant-Colonel H. N. A. Hunter, D.S.O., Queen's Royal Regiment.
Colonel F. W. C. Jones, C.B., M.B., late R.A.M.C.
Captain J. F. Somerville, D.S.O., R.N.
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Captain H. J. B. Warren, Border Regiment.
Captain H. W. Deacon, D.F.C., R.A.
Lieutenant E. W. Fletcher, R.A.
Major M. J. Macdonald, M.C., 6th Bn., London Regiment (T.A.).

Rear-Admiral W. W. Fisher, C.B., C.V.O.
Lieutenant R. D. K. Cleaver, 5th (Cinque Ports) Bn. Royal Sussex Regiment
(T.A.).
Lieut.-Colonel E. G. Jones, late Pembroke Yeomanry.
Major E. J. Woolley, M.C., 22nd Bn., London Regiment (T.A.).
Lieutenant W. M. Phipps-Hornby, R.A.
Lieutenant J. W. Cornwall, R.A.
Lieutenant A. D. Clinch, King's Own Yorkshire Light Infantry.
Major F. W. Timmis, R.A. (R. of O.).
Lieutenant I. B. Farrant, R.N.
Captain A. N. Venning, M.C., R.A.
Lieutenant St. J. Cronyn, R.N.
Squadron-Leader F. Fowler, D.S.C., A.F.C., R.A.F.
Lieut.-Commander H. J. Johnstone, R.N.
Major M. Luby, D.S.O., M.C., R.E.
Lieutenant F. M. Bramall, Royal Marines.
Captain R. W. L. Fellowes, M.C., R.A.
Captain E. J. Murphy, Royal Corps of Signals.
Captain C. H. D. O. Springfield, R.A.
Major J. S. Townshend, M.C., South Staffordshire Regiment.
Lieutenant D. W. Clarke, R.A.
Captain H. B. Pegrum, M.C., O.T.C.
Lieut.-Colonel E. W. Brighten, C.M.G., D.S.O., T.D., Bedfordshire and
Hertfordshire Regiment.
Captain A. G. Neville, M.C., R.A.
Second-Lieutenant R. W. B. Simonds, Royal Marines.
Squadron-Leader J. O. Andrews, D.S.O., M.C., R.A.F.
Captain C. H. C. Gore, I.A.
Captain E. S. E. Rerrie, I.A.
Lieutenant A. MacG. Stewart, R.E.
Lieutenant G. E. Scott, O.B.E., R.E. (Auxiliary Force, India).
Engineer-Captain W. Onyon, M.V.O., R.N.
Captain R. J. F. McAlister, Argyll & Sutherland Highlanders.
Sub-Lieutenant J. H. P. Graham, R.N.
Captain I. D. Brown, Gordon Highlanders.
Lieutenant P. W. Dimsdale, R.N.
Instructor-Captain R. R. Cummings, M.A., R.N.
Captain G. W. B. Tarleton, M.C., Border Regiment.
Captain B. G. Horrocks, M.C., Middlesex Regiment.
Major W. T. O. Crewdson, R.A.
Wing-Commander W. L. Welsh, D.S.C., A.F.C., R.A.F.
Lieut.-Commander D. Mansfield, R.N.R., retired.
Lieutenant G. A. Meda, R.N.V.R., retired.
Captain G. W. A. Painter, D.S.O., R.A.
Air Vice-Marshal Sir O. Swann, K.C.B., C.B.E.
Captain L. H. Cockram, I.A.
Major P. J. R. Currie, O.B.E., M.C., King's Royal Rifle Corps.
Major S. H. P. Smith, I.A.
Major-General Sir A. H. Russell, K.C.B., K.C.M.G., New Zealand Forces.
Lieutenant J. R. C. Montgomery, R.N., retired.
Captain T. H. Angus, I.A.
Sub-Lieutenant P. N. Churchill, R.N.

Captain D. H. Currie, M.C., D.C.M., I.A.
 Lieutenant K. B. Hicks, Rifle Brigade.
 Captain N. C. Jackson, I.A.
 Captain T. G. Newbury, M.C., Lincolnshire Regiment.
 Captain H. R. Power, I.A.
 Major S. P. Williams, I.A.
 Lieutenant J. R. Hall, Worcestershire Regiment (R. of O.).
 Wing-Commander G. W. Williamson, O.B.E., M.C., R.A.F.

VII.—Finance.

At the meeting of the Council, held on 2nd February, the reports of the Finance Committee, the Journal Committee and the Library Committee with regard to increasing the income of the Institution were considered. It was decided to recommend to the Annual Meeting:

- (1) That the Life Subscription be raised from £15 to £20 (to come into force 1st July, 1926).
- (2) That the Entrance Fee for Annual Members be raised from £1 1s. to £2 2s. (after 30th June, 1926).
- (3) That the Annual Subscription be raised from £1 1s. per annum to £1 5s., to include the 10s. subscription to the Lending Library. This change to come into force for new Members after 30th June, 1926; for present Members, 1st January, 1927.

They also approved of the other recommendations of the Finance Committee, viz. :—

- (1) That the payment for Temporary Membership to Officers of the Indian Army be not less than £1 1s. for 12 months, and 10s. 6d. for 6 months; this to apply to Officers belonging to the Indian Institution.
- (2) That the hire of the Theatre be increased to £6 6s. to Civilian Societies, instead of £4 4s., and £3 3s. instead of £2 2s. to Naval and Military Societies; these to take effect after 1st July.
- (3) That the sale Price of the Journal to non-Members should be increased from 6s. to 7s. 6d., additional copies to Members from 3s. to 4s., and the Annual Subscription for Messes and non-Members from £1 6s. to £1 10s., all post free. The foregoing to take effect from 1st January, 1927.

VIII.—Lecture Postponed.

The lecture which should have been delivered on Wednesday, February 24th, "Public Schools and the Royal Navy," by Commodore His Grace The Duke of Montrose, C.B., C.V.O., V.D., R.N.V.R., is unavoidably postponed for the present.

IX.—Gold Medal Essay (Naval), 1925.

The following additional essays were received, viz.:—

- (11) "Sapiens qui Prospicit."
- (12) "Vinculum Imperia."
- (13) "Giuniore."
- (14) "Fato Providentia Major."
- (15) "Leadership is Destiny."
- (16) "Loyal Devoir."
- (17) "He that commands the sea is at great liberty."
- (18) "Unto him that hath."
- (19) "Rule Britannia."
- (20) "Ut Veniant Omnes."
- (21) "Gradu diverso via Una."
- (22) "Ab actu ad posse valet consecutio."
- (23) "Heu vatum ignaræ mentes."
- (24) "Mutatis mutandis."
- (25) "Cast your bread upon the waters."
- (26) "For the wise pedlar, a stout staff."

X.—Museum Purchase Fund.

This fund was opened with the object of purchasing suitable exhibits, which from time to time are offered to the Museum, or are put up for sales at various auctions. The Council hope it will receive support from members of the Institution who are interested in the Museum.

					£	s.	d.
Amount already acknowledged	..	..	..	..	69	11	0
Colonel J. F. Manifold, C.M.G.	..	..	..	..	5	5	0
B. E. Sargeaunt, Esq., O.B.E., M.V.O., F.S.A.	..	..	..	..	2	3	0
						76	19 0
Less Expended to date	..	..	..	..	45	16	10
					£31	2	2

XI.—The Museum.

The amount taken for admission to the Museum during the past quarter was:—

£99 13s. in November.

£54 1s. in December.

£86 6s. 6d. in January.

ADDITIONS.

- (7906) A pair of Regimental Colours of the Royal Fusiliers (1785-1796), they probably belonged to the Second Battalion, which was disbanded in 1796, who handed them to the First Battalion for safe custody, where they have been retained to the present time.— Given by the Colonel and the O.C., and the Officers, 1st Bn. The Royal Fusiliers, by permission of H.M. the Colonel-in-Chief.
- (7907) Model of the British Grand Fleet which fought the Battle of Jutland on May 31st and June 1st, 1916, 151 model vessels in all. Scale, 1 inch represents 100 feet. For description see the labels round the Model. The Models were made and arranged by Mr. Norman A. Ough.—Placed on permanent loan by Mr. Norman A. Ough.
- (7908) A collection of Regimental badges, buttons, etc., of the 12th Foot.— Given by Colonel C. Montagu, C.B.E.

THE JOURNAL FOR 1926.

With the publication of the first number of the 1926 Volume, which coincides with a new printing contract, the Editor is authorised by the Council to make known their future policy with regard to the JOURNAL of the Institution.

In the course of the past year special effort has been directed towards modernising its contents with a view to making the JOURNAL of further value to the serving officer.

It is desired that all officers shall come to regard this publication as a useful and officially recognised means of making known their opinions on professional matters, with a view to developing the higher study of war, the better understanding of Imperial Defence and a closer relationship between the doctrines, tenets and activities of the three Services.

The JOURNAL enjoys the unique privilege of receiving the active support and assistance of the Naval Staff, the General Staff of the Army and the Air Staff, while a close liaison is also maintained through representative Members of the Council with the Historical Section of the Committee of Imperial Defence, the Naval War College and the three Staff Colleges.

The Council particularly desire to encourage contributions from the younger generation of serving officers. If official approval has not already been obtained by such writers, the Editor will ensure that this is done before their articles are published. To those who have not had much experience in putting their views on paper the Editorial Staff will gladly offer their best assistance and advice. Articles may be published anonymously if authors so wish.

Special features recently introduced into the JOURNAL and which it is intended to continue to develop in future are : (a) articles dealing with those aspects of the commercial and economic life of our nation which vitally affect our powers of defence and the well-being of the Services ; (b) scientific developments in relation

to weapons ; (c) the military situation abroad especially in disturbed parts of the world ; (d) correspondence. Members are specially invited to send contributions of the above nature, for which remuneration will be made unless they are offered free.

There is no intention of dropping the time-honoured connection of the JOURNAL with the historical associations of the Services, but preference will be given to articles dealing with past events which not only add to the store of historical knowledge but which also bring out the lessons which should be deduced therefrom.

The JOURNAL has been considerably enlarged and is now more liberally illustrated. It is the medium which links together the Members of this Institution and, through them, the Services in all parts of the world. The Council hope, therefore, that Members will do their utmost to support it both by contributing from the stock of their many and varied experiences and by getting new readers to join the Institution.

RECIPIENTS OF THE ROYAL UNITED SERVICE INSTITUTION GOLD MEDAL

(With rank of Officers at the date of the Essay).

- | | |
|--|---|
| 1874. Captain H. W. L. Hime, R.A. | 1900. No Medal awarded. |
| 1875. Commander G. H. U. Noel, R.N. | 1901. Lieutenant L. H. Hordern, R.N. |
| 1876. Lieutenant J. F. G. Ross of
Bladensburg, Coldstream Guards. | 1902. Major A. H. Terry, A.S.C. |
| 1877. No Medal awarded. | 1903. Lieutenant A. C. Dewar, R.N. |
| 1878. Major T. Fraser, R.E.
Captain E. Clayton, R.A. | 1904. Lieut.-Colonel C. E. D. Telfer-
Smollett, 3rd Bn. South Staf-
fordshire Regiment. |
| 1879. Captain The Hon. E. R. Fre-
mantle, C.B., C.M.G., A.D.C.,
R.N. | 1905. Major W. C. Bridge, South Staf-
fordshire Regiment, p.s.c. |
| 1880. Captain J. K. Trotter, R.A. | 1906. Lieutenant B. E. Domville, R.N. |
| 1881. Captain L. Brine, R.N. | 1907. Lieut.-Colonel A. F. Mockler-
Ferryman, Reserve of Officers. |
| 1882. No Medal awarded. | 1908. Major A. B. N. Churchill, R.G.A. |
| 1883. Captain C. Johnstone, R.N. | 1909. No Medal awarded. |
| 1884. Captain G. T. Browne, North-
amptonshire Regiment. | 1910. Captain P. W. Game, R.H.A. |
| 1885. Lieutenant F. C. D. Sturdee,
R.N. | 1911. Captain H. T. Russell, late
R.G.A. |
| 1886. Captain C. E. Callwell, R.A. | 1912. Commander K. G. B. Dewar,
R.N. |
| 1887. No Medal awarded. | 1913. Major A. Lawson, 2nd Drags. |
| 1888. Captain J. F. Daniell, R.M.L.I. | 1914-15-16-17. No Medals awarded. |
| 1889. Captain H. F. Cleveland, R.N. | 1918. Lieutenant W. S. R. King-Hall,
R.N. |
| 1890. Captain G. E. Benson, R.A. | 1919. Colonel J. F. C. Fuller, D.S.O.,
Oxford & Bucks L.I. |
| 1891. Captain R. W. Craigie, R.N. | 1920. No Medal awarded. |
| 1892. Lieut.-Colonel J. Farquharson,
C.B., R.E. | 1921. Flight-Lieutenant C. J. Mackay,
M.C., D.F.C., R.A.F. |
| 1893. Commander F. C. D. Sturdee,
R.N. | 1922. Major R. Chenevix-Trench,
O.B.E., M.C., Royal Corps of
Signals. |
| 1894. Major F. B. Elmslie, R.A. | 1923. Captain A. H. Norman, C.M.G.,
R.N. |
| 1895. Commander J. Honner, R.N. | 1924. Major L. I. Cowper, O.B.E.,
King's Own Royal Regiment. |
| 1896. Captain G. F. Ellison, Queen's
Royal West Surrey Regiment. | |
| 1897. Commander G. A. Ballard, R.N. | |
| 1898. Captain W. B. Brown, R.E. | |
| 1899. Commander G. A. Ballard, R.N. | |

RECIPIENTS OF THE CHESNEY GOLD MEDAL

(With rank of Officers at the time of the Award).

- | | |
|--|---|
| 1900. Captain A. T. Mahan, United
States Navy. | 1914. Sir Julian S. Corbett, LL.M.,
F.S.A. |
| 1907. Major-General Sir J. F. Maurice,
K.C.B., p.s.c. | 1919. Major-General E. D. Swinton,
C.B., D.S.O. |
| 1909. Hon. J. W. Fortescue, M.V.O. | 1921. Major-General Sir C. E. Callwell,
K.C.B. |
| 1910. Sir J. K. Laughton, Knt., M.A. | 1924. Professor G. A. R. Callender,
M.A., F.S.A. |
| 1911. Professor C. W. C. Oman, M.A.,
F.S.A. | 1925. Captain Sir George Arthur,
Bart., M.V.O. |
| 1913. Colonel Sir L. A. Hale. | |



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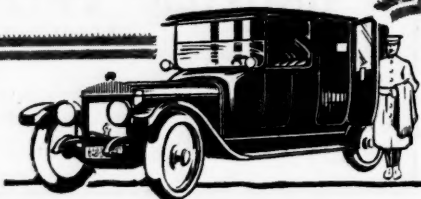
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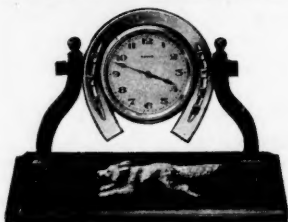
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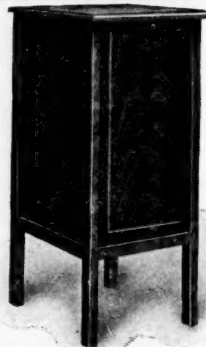
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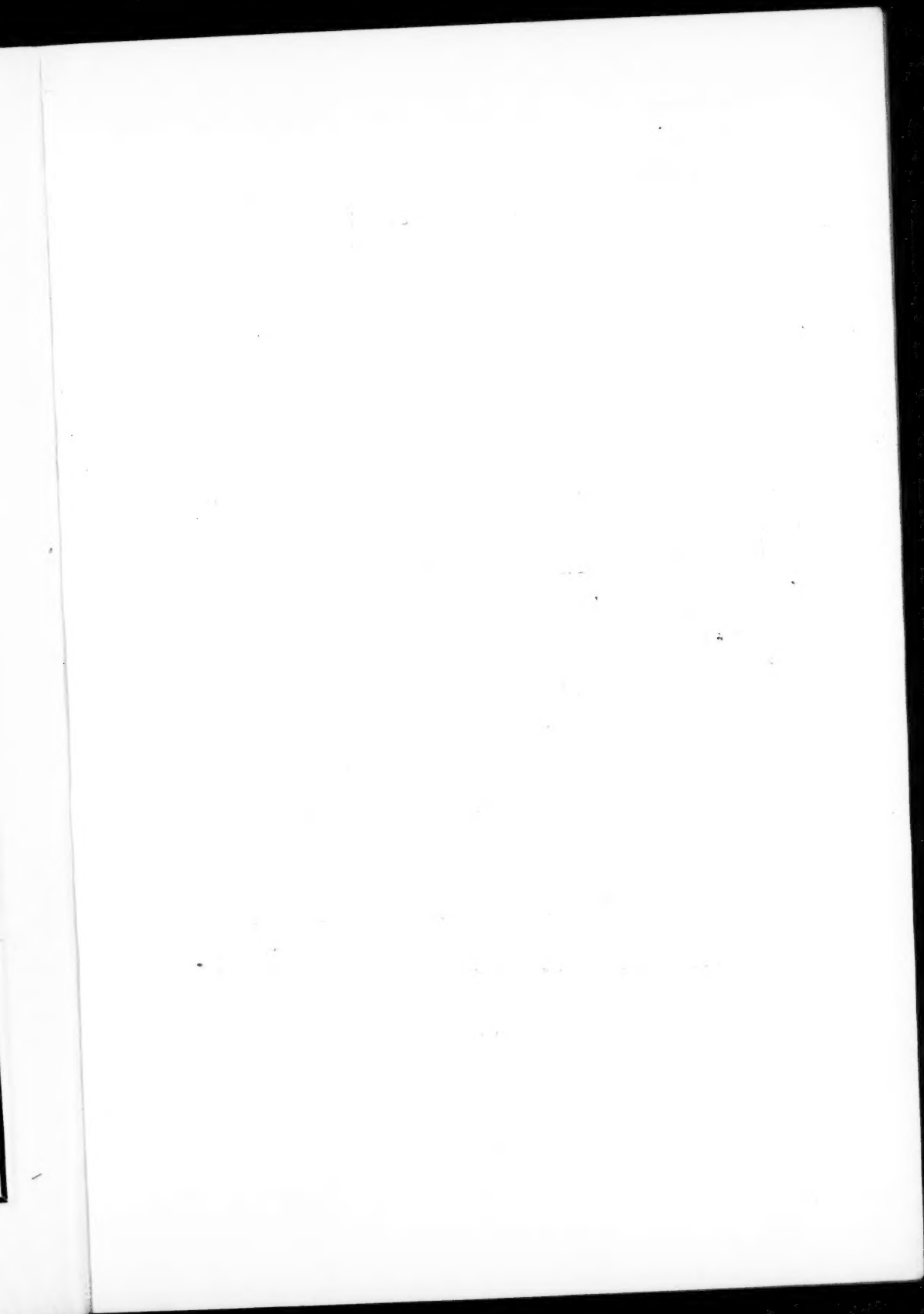
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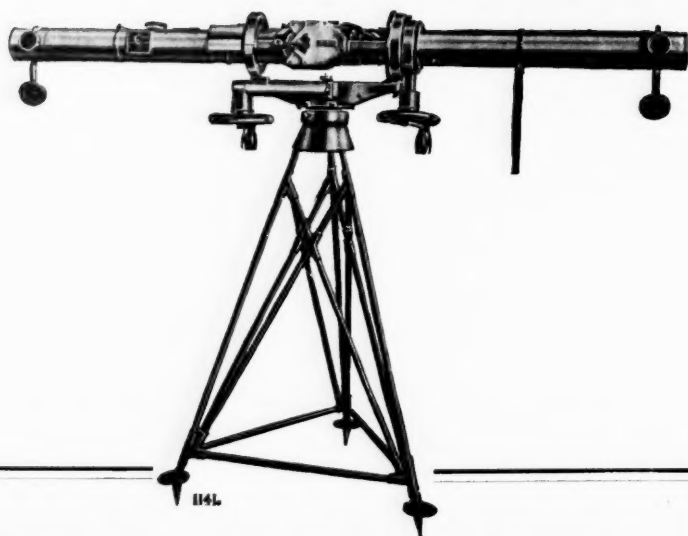
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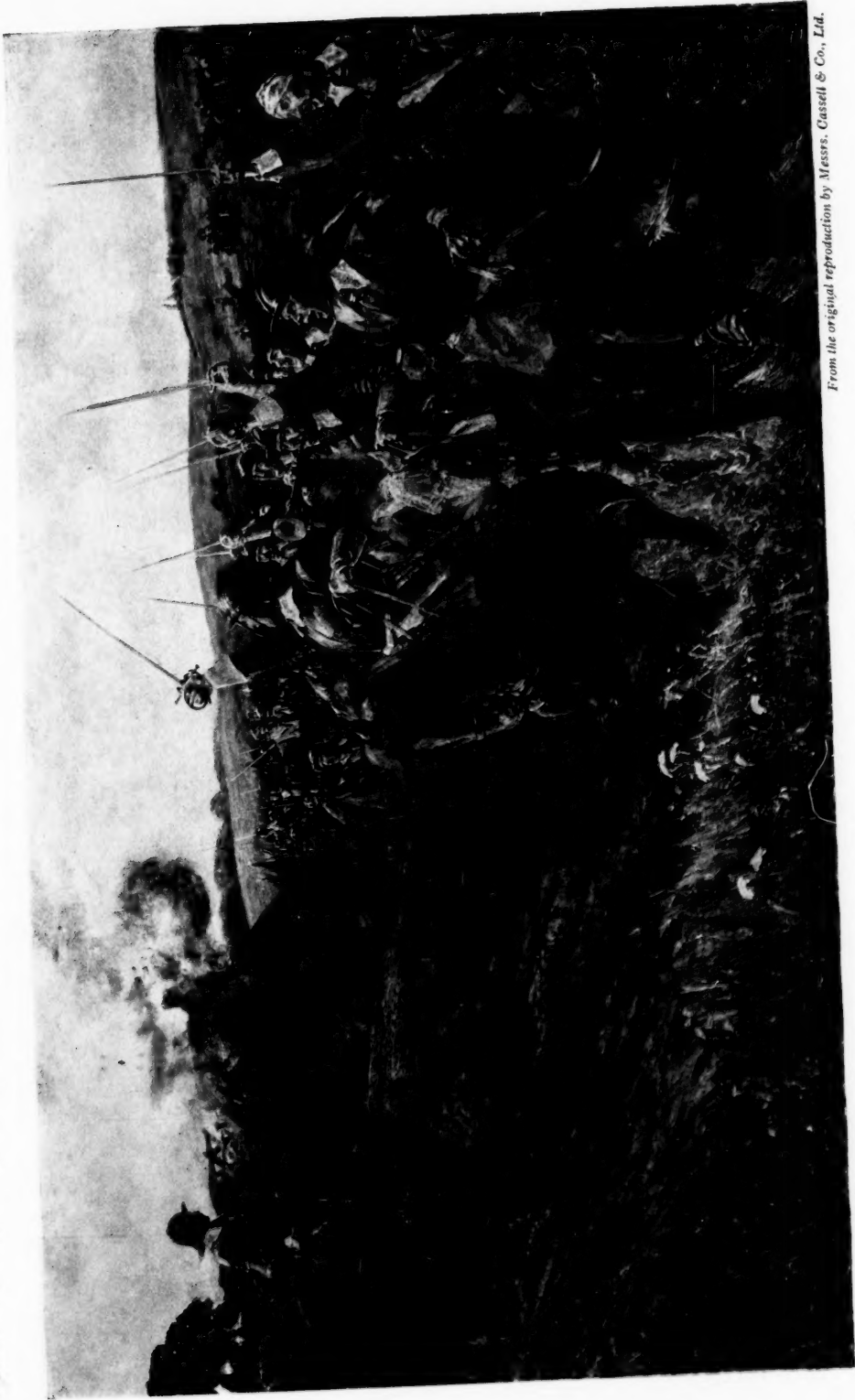
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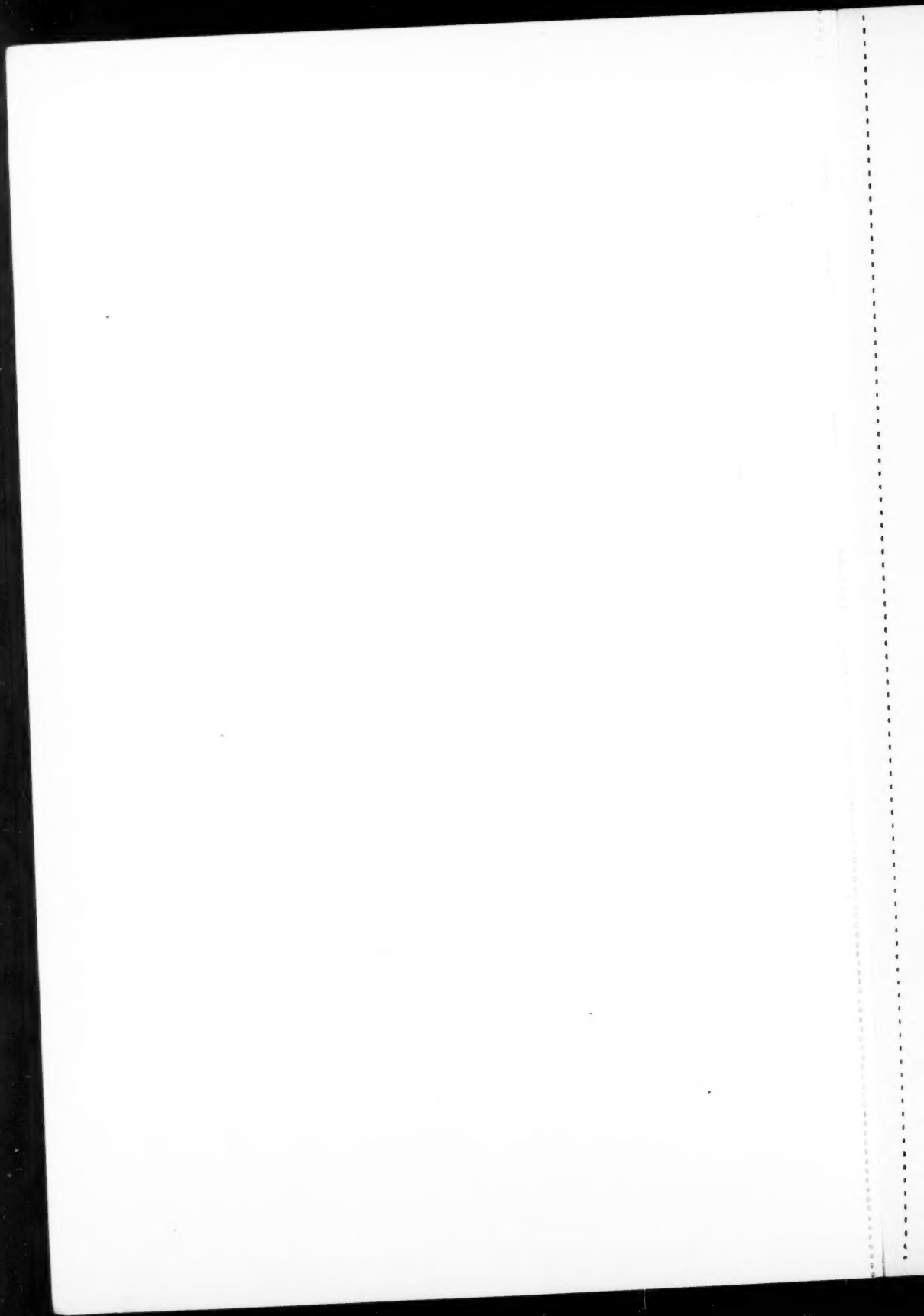




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**IMPERIAL DEFENCE AND THE
CO-ORDINATION OF THE THREE SERVICES.**

By MAJOR-GENERAL SIR J. H. DAVIDSON, K.C.M.G., C.B., D.S.O., M.P.
On Wednesday, 18th November, 1925, at 3 p.m.

FIELD MARSHAL SIR W. R. ROBERTSON, G.C.B., G.C.M.G., K.C.V.O.,
D.S.O., in the Chair.

THE CHAIRMAN: Ladies and Gentlemen,—You are no doubt aware that it was intended that Lord Haig should preside at this meeting to-day, but a few days ago the Secretary heard that he was unable to come and I was asked to fill the vacancy. I consented, not because I have anything special to say on the important subject that is to be discussed, but because I thought it was rather hard on the lecturer who had been pressed to give the lecture and had spent much time in preparing it, to find at the last moment that there was a difficulty about the Chairman. You will regret that Lord Haig was prevented from coming, because you would have liked to hear his views. Having explained why I am here, I will now ask Sir John Davidson to proceed. He requires no introduction from me or anyone else, but from what I personally know of his work, before and during the War, he is well qualified to address you on Imperial Defence matters.

A

LECTURE.

MAJOR-GENERAL SIR JOHN DAVIDSON: Ladies and Gentlemen, I hope you will forgive me if I preface my remarks this afternoon by making a few personal observations. I have been asked to speak on the subject of Imperial Defence and the Co-ordination of the Three Services. I am not sure that you understand what I mean by this. What I understand by it is the consideration of the higher organisation of the Services and of Governmental machinery for ensuring economy and efficiency, avoiding overlapping, duplication and waste, securing co-ordination of effort in all matters of administration and defence which relate jointly to two or more of the Services. I think it is as well to define exactly what the meaning of this subject heading is before we start.

I hope I may count on your indulgence this afternoon in my endeavour to deal with a subject which I think all will agree is as controversial, complex and, nevertheless, important as any subject could well be. I ask your indulgence especially to-day, seeing that an officer well known in America and of high rank in the American Service has recently been arrested for propagating his opinion on this very subject.

You may well ask who am I to express opinions on such weighty matters. My answer is that I claim no qualifications for dealing with it except that I am interested in the subject; I did not volunteer to deliver this lecture, but merely took my orders from a Chief whose authority I have never questioned.

The only virtue I can claim apart from a general interest in the subject is this: that the politicians possess a monopoly of the brains of the country—at least we have this assertion from the leading politicians themselves, and therefore I think no one can controvert it—and you will remember that I am a politician. On the other hand, my own belief is that the soldiers, sailors and airmen have as good as, if not better, brains than anybody else, and in this connection I take the opportunity of classifying myself as a soldier.

On your part I am naturally assuming that everyone present here this afternoon has read the speeches of various Prime Ministers, Chancellors of the Exchequer and Cabinet Ministers on the subject, has read all the articles in the newspapers and periodicals and all the reports of the various conferences and committees which have been held, such, for example, as the Geddes, Weir and Salisbury Committees and others.

For my own part I see very little achievement in all this mass of speechmaking and literature, but a great diversity of opinion. Nor do I get much enlightenment from those papers which have been composed by soldiers, sailors or airmen, for in some they ignore the political aspect of the problem, and in nearly all they neglect the financial aspect altogether.

In any case the upshot of all this discussion and writing is nothing. The Committee of Imperial Defence remains the same, except that it is given substance now instead of shadow, and except that the three Chiefs of the Staff are supposed to have joint responsibility of an indeterminate character entirely imaginary and without any reality whatsoever.

IS THERE ANY NECESSITY FOR A CHANGE IN OUR DEFENCE ORGANISATION ?

The question I have to put to you is this : Is there really any necessity for change in our organisation and machinery for defence and in our system of control and co-ordination ? Is there any reason for the complaints which we are constantly hearing on all sides, or ought we to be satisfied with the existing state of affairs as the best which can be devised and sufficient to meet all requirements ?

I remember before the war reading the history of this country, especially the military history after the Napoleonic Campaigns, and since the war I have read one or two interesting articles on that particular topic. It has always seemed to me, and it seems to me to-day, that both the Navy and the Army were in a very high state of efficiency at the close of the Napoleonic Wars, but that in a very short space of time—I think very largely owing to the requirements of economy—those Services did lapse into a state of inefficiency, a degree of inefficiency, at all events. Peace is not conducive to efficiency, and unless one keeps one's eyes open and one's organisation up to a pitch of excellence the demands of economy, especially after a great war, may have the result that the Services will lapse into a state of inefficiency. To-day those factors are present just as much as they were a hundred years ago.

To-day we have, as everyone here knows, an insistent demand for further economies. We have the advent of the Air arm and many technical difficulties which did not exist a hundred years ago, an Empire more difficult to defend to-day than one hundred years ago, and, moreover, any great war to-day means the mobilisation of the whole nation and the whole national resources. Who would say that our organisation, which is virtually the same as in pre-war days, is the best that can be devised, or is adequate ? The point is : Is the organisation and machinery which was in existence before the war sufficient to cope with our task as it presents itself to us to-day ?

THE STATUS OF THE AIR MINISTRY.

One complex matter, which makes it very difficult to deal with this question, is the introduction of a third Ministry, the Air Ministry, and I think before I go any further in my remarks I should deal with

this problem and come to some conclusion upon it. There is undoubtedly a very strong feeling against the existence of the Air Ministry at all, and there are many officers in the Navy and the Army, and civilians also, who believe that the Air Ministry *qua* Ministry should be abolished, and that in its place some central department for research and supply should be instituted and that the aircraft of this country should be divided between the Navy and the Army.

I have had many interesting discussions with officers of the Army in positions of authority, who have expressed the opinion to me that the War Office should swallow the Air Ministry and merely disgorge a wing to the Navy, and I have had certain discussions with Naval officers, and I have read papers written by Naval officers who suggested that the Admiralty should swallow the Air Ministry and merely disgorge a wing for the Army. I am not going to waste time in dealing with this subject at great length, because I do not think it is worth the time and trouble, for I do not believe that any Party or any Government would take the responsibility of abolishing the Air Ministry, primarily on account of three stock arguments, which are always produced in any discussion on the subject :—

- (1) The people of this country are nervous of air attack, and it has been agreed by the C.I.D. that the risk of air attack has increased, while that of seaborne invasion has decreased. This has undoubtedly created an impression on the public mind. Both the public and the press are jealous of any interference with the Air Ministry.
- (2) If the air is divided as an auxiliary to the two older Services, air development will be arrested to some degree.
- (3) It was the practical experience of war which gave birth to the Air Ministry, and if it had not been for the war it would probably have remained divided between the other two Services.

I do not attach so much importance to the last argument as I do to the first two, but nevertheless those three arguments, as I know from addressing public meetings and talking to many people, have undoubtedly made a deep impression on the public mind, an impression which will not be easily dissipated.

THE AIR SERVICE IN FOREIGN COUNTRIES.

We do not get much guidance from foreign countries. Our task is so different from that of other nations. No other nation is at the same time both subject to serious air attack from a neighbouring country, dependent for its supplies from overseas, and responsible for possessions in every quarter of the globe.

America is often quoted as a country without an Air Ministry, but she is not subject to air attack of any magnitude whatever. Her case and ours are utterly dissimilar. France also is quite different, for her defence is concentrated in her Army; she has a constant well-defined defence problem before her. Italy, on the other hand, has her three Ministries, and she has her machinery for co-ordination, in her Supreme Commission of Defence, and Supreme Chief of the General Staff.

I look upon the development of aircraft in the future as of immense importance. I believe everyone is agreed on that. I regard the air weapon as a great moral weapon which, if used properly and in sufficient numbers will be capable of lowering, if not destroying, the national will power of an adversary. It will be effective against cities, centres of production and communications, and provide the best means of defence against air attack. The argument as to whether aircraft are or are not effective against ships or troops in action has nothing to do with the point I wish to make, namely, the great moral power of the air in future wars.

In my opinion the Air Ministry has come to stay, and it is our duty not to quarrel with it, but to make the best of it and accept it, and see how best we can adjust our defence organisation so as to include it. I do not mean by this that it is not necessary for the Navy and Army to have their own Fleet Air Arm, and Army Co-operation Squadrons, or whatever you may call them—this is essential for Artillery observation and reconnaissance purposes. I go further and believe that, for example, the man who observes for Artillery from the air should be above all an Artillery man.

It seems to me that a natural corollary to my argument is that if you have only two Services you may possibly leave the co-ordination to them—but if you have three Services you must devise some machinery for co-ordination. If you had ample funds and economy was of no great importance, the necessity for co-ordination would not be so pressing—but in proportion as the requirements of economy are urgent, so in the same ratio is co-ordination urgent.

This brings me to my next point—the matter of economy.

FINANCE AND REQUIREMENTS OF ECONOMY.

This is a vital matter. As I have already indicated, it would be a comparatively simple matter, even without any effort in co-operation, to supply the full requirements of Imperial Defence if there were ample funds available, but that is precisely where the difficulty arises—a difficulty which is seldom recognised in the Services.

We are spending to-day over 120 millions a year on defence, and yet each Service is being cut down to the bare bone. We live under a democratic form of Government, with a very wide franchise and a mass of uneducated voters. The House of Commons controls the national

purse strings and its members are elected in the main by those who clamour for larger expenditure on social services and for greater support of the League of Nations and reductions in armaments. From a body such as this you cannot expect, nor will you get, an increase over the 120 millions, but you can expect and will get a considerable reduction in the years in front of you.

The average voter in an industrial area will vote for the man who advocates a better education for his child and a higher old age pension for himself. He does not really care about the Services however much you may talk to him. If you do not believe this I would just like to draw your attention to the fact that at the last General Election there was a great wave towards Conservatism, but notwithstanding that wave, which is exceptional, and not the rule, the Labour Party had something like one million more votes polled for them than they had at the previous election. I want to put that aspect to you and another aspect. There is the other kind of person who says—with truth—that the present rate of taxation is a burden on industry, and if he cannot get economy in other directions he will press for it in the direction of armaments.

There is yet another aspect of finance, and an important one. You in each Service, base your organisation on expansion for war. The same thing is necessary in finance. There is not much capacity for expansion with an income tax at the rate of 4s. in the £, and a dead-weight of debt of something over 7,000 million sterling. Yet, in a great war, we should have to raise money somehow and our financial expansion would be just as important as, if not more important than, our military, naval and air expansion.

If the Services think they can maintain their combined expenditure at the 120 millions level, or anything near it, I am afraid they are much mistaken.

It comes then to this: we shall have to discard ideals and get down to bare essentials and go in for a process of substitution. By that I mean that we shall have to do the sort of thing that the Admiralty recently did, namely, cut down dockyard expenses in order to build more cruisers. It is an unpleasant outlook, but one which I am sure has to be faced, and the only way in which we can carry out this economy with the least damage is to ensure that the three Services should co-operate in the closest possible manner and in complete harmony. The rumour and the generally-accepted belief is—and it is very unfortunate if it is true—that there exists neither this complete co-operation nor complete harmony, which is so necessary when there is so much to be done.

THE RELATIONSHIP OF THE THREE SERVICES.

It follows, that if we accept the Air Ministry—and I believe we have got to do so whether we like it or not—and if the need for economy is urgent, indeed vital as I realise it to be—then we must

make the co-ordination, co-relation and co-operation, or whatever you like to call it, of the three Services very real.

I want to expand this statement a little,—I am not going to discuss warlike operations and the plans for them, we all know the history of Gallipoli and Antwerp and the necessity for joint formulation of plans for war—I want to confine myself to organisation and maintenance in peace of such forces as may be necessary to give effect to the Government's policy in peace and in war.

In peace, as I have said before, funds are limited. In war it is a different matter. If in peace, funds were unlimited then we could have a Navy right up to the restrictions of the Washington Conference, we could have an excellent Expeditionary Force and Territorial Army full up to establishment, and an Air Force equal to meet any emergency. It is the business of the Government to define the policy and the means, and relationship between the two, and it is the business of the Defence Services to make the most of every sixpence available, avoiding duplication and overlapping, and utilising substitution of one means of defence for another wherever possible.

As I say, the Admiralty, within their own department, have already done something in this direction, in substituting to some extent cruisers for dockyards. Consideration should be given to the subject on a larger scale. Is there anything to be done in the way of substituting mobile for fixed defences in our defended ports and bases? For the economic defence of an Empire such as ours mobility of defence is essential. I doubt the advisability of spending much money in mounting 15" guns at Singapore, for example.

I only mention this as one example. I cannot help feeling that we are reverting passively to pre-war methods and ideas of defence, and merely superimposing a minimum of air defence on to our old arrangements. We have to look forward ten or fifteen years and lay our plans accordingly—these will be very lean years.

I feel that, admitting such conditions, we ought to pursue a policy of defence which rests on mobility, power of rapid expansion and research. It seems to me that there is great scope in the adjustment of a balance between the three Services, but it requires the most careful and deliberate combined study of the general staffs of those Services, working in close co-operation and harmoniously.

The British Empire is extraordinarily difficult to defend, but fortunately for us we have a large number of stepping-stones all over the world, making rapid movement and concentration possible. We ought to make the most of this.

Apart from the balance between the Services there is also the question of the existing differences of opinion :—

(a) The first thing that enters one's mind in this connection is the controversy between the Navy and the Air in relation to the Fleet Air

Arm. Why has not the Army got an Army Air Arm, instead of Army Co-operation Squadrons? Are both the Navy and the Army satisfied with what they have got? Surely it is not beyond the power of the three General Staffs to formulate some combined scheme which will satisfy the requirements of all three? I need not elaborate this further; the arguments are well known to us.

Again, I find in the Salisbury Committee's report a statement that in relation to the protection of maritime communications in the narrow seas there were revealed wide differences of professional opinion between the Naval Staff and the Air Staff, both in matters of principle and detail.

(b) Further, I am told on all sides that there is great waste in the administrative services of the Navy, Army and Air Force by overlapping and unnecessary duplication. Of course, I refer to such departments as Medical, Chaplains, Pay, Contracts, Lands and the like. It is inconceivable to me that, for example, one Lands Department and one Contracts Department should not satisfy the requirements of all three Services. Surely it is better to effect some economy here if economies have to be made, and be enabled to maintain an extra cruiser or a few more aeroplanes.

Is there any economy to be achieved in relation to questions of Recruitment, Establishment and General Administration of the Fleet Air Arm and Army Co-operation Squadrons? Is there any possible means of reducing the ratio of ground men to each aeroplane? I have only mentioned a few of these points very casually; no doubt there are many more, but I think there is ample scope for much economy to be achieved.

THE DOMINIONS AND OVERSEAS FORCES.

Let me draw your attention to another aspect of Imperial Defence which will become, in my humble opinion, of immense importance in the future. I refer to the re-distribution of the population of our Empire. I firmly believe that economic pressure at home will force people to migrate to the Dominions in ever-increasing numbers in the years to come and that this will be the great feature in the development of the Empire during the present century, just as the industrial development of Great Britain was in the last century. This is going to complicate the whole question of Imperial Defence so far as we in this country are concerned. The growing strength of the Dominions will be a factor which counts and must be used in relief of the burden on the home country; on the other hand, the Dominions are independent and it is only by encouraging them to come into our Councils of Defence that we can achieve any success. If we have a sound machinery and organisation for defence and put our own house in order first, there will be much more inducement to our Dominions to come in and lend us a hand in our heavy task. We should, from the outset, endeavour to obtain the advice of the Dominions in all matters of defence in relation to all three Services whenever possible.

POLITICAL CONSIDERATIONS.

I have cut down these preliminary remarks as much as possible, but I was anxious to make out some case for making four quite reasonable assertions :—

Firstly, the Air Ministry will remain as a permanent institution.

Secondly, there is a great and real need for economy.

Thirdly, Dominion co-operation will become of increasing importance.

Fourthly, there are many points of difference between the three Services and much scope for their joint consideration.

The first two of these are essentially matters for the politician to determine, and I think there can be no doubt as to what decision will be given.

The third, that is to say, the question of Dominion co-operation, is a matter for the Dominions to determine, but we can be quite sure that the best inducement to them to come into our Councils is to get our own house in proper order first.

The fourth is the matter with which I have to deal now, based on the assumptions which I have already made. It is a question largely for the Services to determine themselves. It is for the Services to give effect to the Government's policy within the limit of the means available by the most up-to-date organisation and efficiency, by research and by general excellency of staff work.

It would be quite easy for the Services to deal with this problem if they could eliminate the politician, but in a democracy such as ours it is the politician who represents the will of the people. The administration of the country is vested in the Prime Minister and the Cabinet, and when you grumble at the politician you really grumble at our system of democratic government.

The Prime Minister selects the Members of the Cabinet, and he is the ultimately responsible authority for determining the policy, the means, the question of peace or war, and the conduct of war.

The authorities in the Services are, firstly advisers and, secondly, responsible for execution. In peace it is the business of the Services to see that the best advice is given to the Government on the most economical basis.

Before the war our interests were so scattered all over the world so technically complex, and involved so many questions of major importance, that it was deemed necessary to establish some machinery for crystallising advice—a sort of clearing house for defence problems. The C.I.D. was therefore established.

Since the war, with the advent of the air weapon, problems have become more numerous and more complex, and there were so many vital points of difference in controversy between the three Services that it

was almost the unanimous opinion of all responsible authorities that the machinery of co-ordination and co-relation was insufficient and that the C.I.D., which had met very rarely since the war, was now inadequate for the purpose for which it had been constituted.

The subject was constantly raised in the House of Commons in the years which succeeded the war, whenever estimates were under discussion, and never failed to generate much heat between those members who had been intimately connected with the Services. The result was that the Government set up the Salisbury Committee in the Spring of 1923; this Committee reported in November of that year, and its recommendations were carried out.

EXISTING MACHINERY AND COMMITTEE OF IMPERIAL DEFENCE.

I feel I must give you a resumé of the recommendations of the Salisbury Committee. There are certain landmarks in the history of our defence evolution, such as the Esher Committee, the establishment of the C.I.D., etc., and the Salisbury Committee is one of them.

Its findings may be reduced to four expressions of opinion and three recommendations. The four expressions of opinion are these :—

- (1) Co-operation for protection of communication in the narrow seas should be the subject of further investigation in technical differences of opinion.
- (2) As regards Home Defence, the menace of air attack has increased and that of seaborne invasion has decreased.
- (3) A Ministry of Defence is undesirable and impracticable.
- (4) The existing system of co-ordination through the C.I.D. is insufficient.

The three recommendations were :—

- (1) Definite members should be appointed to the C.I.D., including the three Chiefs of the Staffs.
- (2) The three Chiefs of the Staffs, in addition to their functions as advisers in relation to their respective Services, should have an individual and collective responsibility in advising on defence as a whole and should form a Super-Chief of War Staff. They should meet together to discuss questions affecting their joint responsibility.
- (3) The C.I.D. Secretariat should be increased by the addition of an Air Secretary.

As a matter of fact, the whole of these recommendations may be reduced to one item of supreme importance, namely, joint responsibility for the three Services is intended to be imposed on each Chief of Staff who is also a member of the C.I.D. This joint responsibility, though visualised as a reality is more imaginary than real, for the Chiefs of

Staff have no special staff to study jointly the many problems of supreme importance affecting the Services. The C.I.D. Secretariat is only composed of three technical officers, who must obviously be ineffective for the purpose.

It is, however, the admission of the necessity for joint responsibility that I want to emphasise, and we must recognise that there is neither any real responsibility in this arrangement, nor is there any effective machinery for reaching well-balanced joint decisions.

The Salisbury Committee laid stress on the necessity for joint responsibility on the part of those responsible in the three Services, but they did not clothe the War Office, the Admiralty and the Air Ministry with any garments of joint responsibility at all. They simply stated that the joint responsibility should exist. Now I want to focus your mind on the question of this joint responsibility which has been stressed so much by the Salisbury Committee. There are no doubt many who say that it is quite sufficient if the three Chiefs of Staff meet occasionally and that the C.I.D. Secretariat is all that is necessary to draw up and record joint advice and recommendations. Personally, I do not think that this arrangement is by any means sufficient to handle the complex and important problems, some of which I have already alluded to; and in this view I think I am supported by almost every Minister who has held a position of responsibility in relation to defence since the War. I will not trouble you with quotations from their speeches, though I have them here with me. All I am asking for is that this joint responsibility advocated by the Salisbury Committee should be made effective and not allowed to remain chimerical, as it is at present. The question is: How is it to be achieved?

A MINISTRY OF DEFENCE AND OTHER PROPOSALS.

Many responsible authorities are of opinion that the existing conditions necessitate the establishment of a Ministry of Defence. Two of these authorities are the Geddes Committee and the present Chancellor of the Exchequer. In addition I have heard the same opinion expressed by many responsible senior authorities. I must admit for my own part that the suggestion of a Ministry of Defence appears at first sight to be very attractive.

The views of the Chancellor of the Exchequer are represented in his speech in the Commons:—

“No solution of a harmonious or symmetrical character will be achieved in the co-ordination of the Services except through the agency of a Ministry of Defence, but it is not possible to create such a body at the present time, nor will it be possible for a considerable time to come.”

The Geddes Committee was set up in order to obtain economy, and their idea was to have a Secretary of State with three Sub-

Ministers who should be responsible respectively for the Admiralty, the War Office and the Air Ministry, and preside at the Board of Admiralty, Army Council and Air Council. The Secretary of State was to have his Defence Council, consisting of the Sub-Ministers and two members each from the Board of Admiralty, Army Council and Air Council.

It is remarkable that the ideas of the Geddes Committee coincide, to some extent, with the arrangements of the Italian Government. Where there are three Ministries there must also be some machinery for the co-ordination of those Ministries.

There are other authorities who recommend the Defence Ministry, but to those who are particularly interested in this subject I think the most useful and instructive statement on the political side is the report of the Sub-Committee on "Machinery of Government," presided over by Lord Haldane—this was a Sub-Committee of the Ministry of Reconstruction set up during the War period. It shows up an unwieldy Cabinet of twenty-two members and points out the advantages of reducing the Cabinet to twelve members and how that might be achieved. One particular item in his recommendations was the combination of the three Services under one Ministry.

I do not know if Lord Haldane does now, as a matter of fact, advocate a Defence Ministry, but in any case a pamphlet or report on the re-adjustment of the machinery of Government does not mean much to us in this connection at the present time, for the simple reason that any drastic adjustment of governmental machinery is very difficult to achieve, and, at the best, is a very lengthy process. We have the example of obviously necessary reform, such as that of the House of Lords; this has been talked of for many years, but nothing has yet been done. I feel that at the present moment there would be an overwhelming opinion in Parliament against a Ministry of Defence. If such a Ministry is really necessary, we require to prove our way gradually by a process of evolution.

The stock argument against a Ministry of Defence is that it would put too much power into the hands of one Minister, and that not the Prime Minister, who is the responsible authority. This would be the case in peace in relation to finance, and in the event of war it might prove a positive danger. We are asked to imagine an efficient and powerful Minister of Defence with an effective administrative organisation behind him. We are told that he would certainly be a rival to the Prime Minister and that this would open out every conceivable chance of friction. It is further asserted that such an arrangement would not work in peace because the Minister would have too great a hold over finance and it would not work in war because the Minister would be in a position almost to dictate to the country.

I will not say that a Ministry of Defence will not be the eventual solution. It may prove to be so. But we shall have to go through

several evolutionary stages, not only in relation to defence arrangements, but also in the whole subject of the machinery of government.

SOME OBSERVATIONS AND SUGGESTIONS.

Let me now come back to the question I put to you originally, at the beginning of my remarks: "Is there really any necessity for change in our organisation and machinery for defence and in our system of control and co-ordination?"

My answer to that is, most emphatically, that there is a necessity for change, and that we must find some method of making the joint responsibility of the three Chiefs of Staff more real and effective, and that the oft-proposed solution of a Ministry of Defence is as yet impracticable.

It sounds very easy to find some way of achieving this desired degree of joint responsibility, but when your solution must be found in that borderland where Service and political responsibilities meet a satisfactory solution is very difficult and one has to tread warily. One must respect the susceptibilities of the politician and be careful not to poach on his preserves.

In addition, there are departmental prejudices and strong feeling in the Services as to their respective inviolability. Furthermore, there is a great mass of opinion in the Navy and Army that the Air Ministry has no right to existence at all. All this does not make for well-oiled co-operation, and no joint responsibility will be really effective unless it is accompanied by the spirit of whole-hearted co-operation.

There is the old saying "United we stand; divided we fall." In these days, when the masses are clamouring for disarmament and reduction in naval and military expenditure, how important is it for the three Services to put forward their joint views, well reasoned, well balanced, with one voice and with the full sense of their joint responsibility.

The politician knows how to play with dissensions and controversies. I have already said that the Salisbury Committee reported under one heading, "The enquiry revealed wide differences of professional opinion between the Naval Staff and the Air Staff, both in matters of principle and detail." It is quite easy to conceive conditions under which a House of Commons might make use of divergent technical views and cut down estimates below the level of safety. The ordinary politician is ignorant in matters of defence and naturally relies on the technical expert.

I cannot help thinking that that man, however able he may be, who makes co-operation difficult because of some ardent prejudice against the existence of an Air Ministry, is doing a great dis-service to his country. It is his business to accept the data which is given to him and to produce the best result. It is not his business to cavil at the data. If his advice is not accepted he can always resign.

IMPERIAL DEFENCE

CONCLUSION.

It seems quite patent to me that the one thing we have to do is to clothe the three Services with some real joint responsibility, and the way I would suggest for your consideration is :—

Firstly, that when any officer is offered the post of Chief of the Staff, whether in the Navy, the Army or the Air Force, it should be clearly defined that his responsibilities are not confined to his own Service, but that he should accept a specific measure of joint responsibility in relation to the major questions of Imperial Defence as a whole.

Secondly, I think it is desirable that each Chief of the Staff should be called upon to sign Vote "A" of the Estimates of all three Services.

Thirdly, that in order to give due consideration to the joint problems of defence a special section of the Operation Staff—Naval, Military and Air—should be set up by the three Services, together under one roof, working day in and day out. In such a manner the three Chiefs of Staff would be able to give well-balanced and unanimous recommendations in the Committee of Imperial Defence.

The first step would be to see how such an arrangement worked. I think I can visualise the possibility, even the probability, of some agreed solution to the question of the Fleet Air Arm and Army co-operation Squadrons being submitted to the C.I.D. Furthermore, suggestions might be put forward regarding the amalgamation of certain administrative services. The estimates might even be considered jointly. I do not want to define what the duties of this Joint Staff Section would be, but they would be of vital importance and multifarious.

In viewing the progress of an arrangement such as I have outlined it would then be for consideration as to what the next step would be. Would it lead in the direction of a Ministry of Defence? It is quite possible. Would it lead to the fusion of administrative departments? It is quite possible. It seems to me that some joint thinking body, such as I have outlined would be the forerunner of a Joint Council of Defence, which would in its relationship to the C.I.D. act entirely in an advisory and technical capacity.

There is nothing revolutionary in this. It appears to me to be ordinary common-sense and practical logic. What do we find in business to-day—in fact in any line of life? We find combinations and amalgamations. It seems to me, therefore, that my proposals are very parallel to what has been achieved in other lines of life.

You all know the report of the Esher Committee; you all know the history of the C.I.D. Nothing is static in this world. However much we dislike it, we have got to move in some direction, and I believe

my suggestions are normal movements ; indeed, logical movements in the process of evolution.

I know very well from long service in the Army the type of conservative mind which says "Stop where you are. We want no interference by the politician. We want no Air Ministry."

I would ask that type of mind to consider the requirements of the present day in conjunction with our financial stringency and democratic evolution. It is of no value to the Service or the State to live in an imaginary paradise.

DISCUSSION.

THE AIR MINISTRY AND THE OLDER SERVICES.

AIR VICE-MARSHAL SIR VYELL VYVYAN: The lecturer at the beginning stated that the naval view, and the military view, was largely that the abolition of the Air Ministry was rather advisable. If I may say so, I think that they want to look after their own interests ; that is to say, they know a good thing when they see it, they both want it, and want it for themselves. If the question is looked at without prejudice, and prejudice was naturally there—if it is looked at by a body of people not composed of either the Army or Navy, the answer, I think, will be always that the Air Ministry is necessary. The air will grow more and more in importance. If we look at what happens abroad, as the lecturer says, Italy has found it necessary to have an Air Ministry. America has not yet got one, but if you talk to American naval or army airmen they always say they must have an Air Ministry, but the Navy say "We hope it is going to be run by the Navy," and the Army say, "We must have an Air Ministry, but we hope it is going to be run by the Army." The Japanese asked me about a year ago my advice on the question of whether they should have an Air Ministry, and my answer to them was that they were not ripe for it, but I said that sooner or later every first-class power, as their development grew, would require an Air Ministry. It would be a tremendously retrograde step if this nation, which first started an Air Ministry, which is the foundation of future air power, should go back on an Air Ministry.

The lecturer has said a few words on what might be called the harmony between the Services. It is very difficult for the Air Ministry, when they have been objected to both by the Army and the Navy, and have been put on the defensive, always to be in harmony with either the Army or the Navy, but if it is recognised that the existence of an Air Ministry is certain—and there should be no question about it in everybody's mind—I do not think there is likely to be so much friction as there has been in the past between the three Services. In fact, there is not nearly so much now as the idea is soaking in that the Air Ministry is there to stay. The friction is getting less and less. There are undoubtedly certain economies which might be obtained, as the lecturer stated, and I will refer to one. It appears to me that if it is recognised that an attack from overseas is not likely at present to come so much over the water as through the air, I personally think that the Air Force can really take over a great deal of work in connection with naval Home Defence and so set free personnel for the work the Navy has to do in the four quarters of the world, freeing it absolutely for offence and cutting off some of the shackles that bind it at present in connection with Home Defence. If that question is gone into closely I think the responsibility can be turned over to the Air Ministry.

ECONOMIES IN THE SERVICES.

COLONEL SIR CHARLES YATE: I am an old colleague in the House of Commons of the lecturer and I have listened to his address with pleasure, but I speak with some diffidence in an audience like this. I think the lecturer was right when he told us how difficult it is to get care for the Services among the mass of the voters in this country. He was right when he said that in the industrial parts of the country the subjects of interest to the voters are education and its concomitants for the children, and higher old age pensions for the parents, and consequently a desire to enforce economy on the Services is natural. I am afraid he is saying what is quite true when he says that we have to fight that desire. There is no doubt about it. He was also right in saying that the 120 million pounds we have now to divide amongst the three Services is probably going to be cut down considerably. I have heard that such a desire has been expressed on the part of the Chancellor of the Exchequer. How best we can mitigate the evils of that cutting down is a question the three Services ought to consider and frame a united opinion. The Navy, as the lecturer has said, has set an excellent example in what he has called substitution. I think that example ought to be followed by the other Services. The Admiralty have shown how, by throwing out one part of their administrative machinery, they can retain the fighting efficiency of the other. Surely we ought to be able, in connection with this question of the unnecessary duplication that goes on in the three Services, to find some scope for amending matters in that respect.

The first speaker referred to the Air Service, that Service we all look upon with absolute astonishment. We see enormous establishments on the ground but very little flying in the air, and we cannot help thinking that a great deal of the land establishments might be taken over by other Forces. I cannot see that there is any necessity for those separate medical arrangements, hospitals and other things. We ought to be able to have some joint work and prevent such a great amount of overlapping.

I think all will agree that the three Services are cut down at the present time below the level of safety. We do not look forward to any invasion of this country, but we do know that at any moment we are liable to have revolutions and troubles abroad. We might have a fresh revolution in Mesopotamia or fresh trouble in Egypt or Palestine, and we may have trouble all over the world at any time. At the present moment the country is much against any sort of war, and any declaration of war—even to fight Turkey over the Mosul question—requiring the sending of British troops from England would have great opposition in the country. We have to be prepared for that.

NEED FOR INTER-STAFF ORGANISATION.

With regard to the question of the three Chiefs of the Staff, I am in entire agreement with the lecturer. If we can only have these three Chiefs of the Staff it is absolutely necessary that there should be a special section of the operations staff of each Service under their immediate orders, entirely free from all other duties, to serve solely in this matter of co-operation amongst the three Services. The Chiefs of the Staff themselves should be set free from ordinary current duties. They are over-burdened at present by their daily duties and they have no time to think out policies and operations on a great scale.

I trust the lecturer's remarks to-day will have a wide effect and be given great consideration by our political chiefs, and that something may come out of

this lecture to further the object he has in view and in regard to which so little has been effected as yet.

CAPTAIN K. G. B. DEWAR, R.N. : The proposals made by the lecturer are of a more practical nature than those put forward by the General Staff on the same subject in 1919. One of the principal features of the printed memorandum issued on that occasion was a kind of composite General Staff.

The proposal that certain members of the Plans or Operations Sections of the three Staffs should, under the direction of their respective Chiefs of Staff, work in the closest co-operation on the broader aspects of all probable wars would probably do something to co-ordinate the machinery of national defence. It would, for example, prevent a repetition of the situation which arose at the time of the Agadir crisis.

Nor does there seem to be any serious objection to the amalgamation of certain similar services in the Army, Navy and Air Force, medical services, hospitals, works department, etc. Why, for example, should not the rank and file of the Army stationed at Naval ports utilise the large and up-to-date Naval hospitals? Such amalgamation might save considerable sums of money.

ARMY AIR REQUIREMENTS.

GENERAL SIR A. A. MONTGOMERY : Sir William Robertson has asked me to say a few words and therefore I cannot very well refuse. To me the lecture has been extraordinarily interesting, because it comes from a man with whom I served personally for many years in the Army, a man who held a high post in the War, and who since the War has had seven or eight years of business and Parliamentary experience. He has therefore been able to talk to us both from the Parliamentary side—I will not call it the politician's side—and the business side, which is of great importance in this discussion. As he rightly said, the whole thing really comes back to finance. We could run a very good Army, Navy and Air Force if we had unlimited money, but, unfortunately, we are not in that position. Most soldiers will, I think, agree that the Air Ministry has come to stay, but I think most soldiers will also agree that if the Air Ministry has come to stay it should make some modification in their present line of action; that is to say, it must stop overlapping and it must give the Army rather more control over the Army Co-operation Squadrons than it has at present. If we get these two things I think the Air Ministry will meet with no opposition from the Army, and the co-operation which the lecturer so strongly recommends will come of itself. I have had the pleasure, during the first two years I commanded the First Division, of having had half an Air Squadron to help me, and last year I had a whole Squadron. During the last year it has been more or less under my orders, but I constantly feel that if that Squadron was entirely under my orders, in the same way that the artillery, the engineers, and the tanks are, it would make my task very much easier. The Squadron Commander is one of the best of airmen and nothing is too much trouble for him to do in order to help me. Yesterday, however, I went down to see the Squadron, and, when I got there, found that in addition to his Army co-operation work he also had to do a great deal of administrative station work, which has nothing to do with the Army at all, and therefore that the whole of his time, which ought to be devoted to helping me to improve co-operation, was not at my disposal. That is the sort of thing that makes it difficult for us in the Army.

LIEUT.-GENERAL SIR NOEL BIRCH : It is not the custom of the Army Council to discuss policy in public and I am not going to break that rule, but I thought I should not like the Air Staff to go away without a message from us to say that if they will make us in the Army a present of an Army Wing at Christmas, it would be a very acceptable gift.

LECTURER'S REPLY.

MAJOR-GENERAL SIR J. H. DAVIDSON, in reply, said : There are just two points raised that I should like to make a remark about. The first was mentioned by Captain Dewar, that there was some confusion of thought with regard to a combined Imperial General Staff, which he had seen referred to in *The Times*, and other places, and I have no doubt he had had in his mind something I had written or said on the subject. It was never my intention that anything more should be done than what I have suggested to you to-day, that in some way the Operation Sections of the three General Staffs should work together. In the House of Lords, Lord Haldane, when he made a speech on this subject, also mis-read what I had said and thought that my idea was that the three Staffs should be completely fused. There was nothing further from my mind, of course.

What Sir Charles Yate has said with regard to the feeling amongst the masses of the people when one is talking to them on this subject of defence is very true, and I should like to emphasize it. You can grumble at a person like myself as much as you like for not pressing the importance of defence, because I represent a strong Conservative constituency and could say anything I think fit on the subject, but my colleagues who represent industrial socialist areas are in a very different position.

THE CHAIRMAN.

FIELD MARSHAL SIR W. R. ROBERTSON : In the precis the lecture is divided into thirteen heads, and if three of them are omitted it may be said that each of the remaining ten is sufficiently extensive to call for a lecture of its own. In these circumstances we could not expect all the ground to be covered by the lecturer, even when re-inforced by those who spoke after him, and I shall certainly not attempt to fill up the gaps, but will bring the proceedings to a close as briefly as possible.

All modern wars, and especially the last one, show the necessity of having at Government headquarters in time of war, efficient machinery for directing and controlling the operations as a whole in all their many and various ramifications. The machinery must not only be theoretically good in itself, but it must be well understood by those who have to work it.

At the commencement of the Great War the machinery we had consisted of the Cabinet, the Committee of Imperial Defence, the General Staff, and the Naval Staff. How was it used ? On August 5th, a Council of War was summoned to decide what troops should be sent to France and where they should go when they got there. It was attended by about twenty Cabinet Ministers and seven soldiers, and by some sailors also, I suppose, and it is not surprising to know that there was considerable disagreement between these many authorities as to what should be done.

Later, the greater part of the General Staff went to France, the C.I.D. fell into abeyance, and the only definite machinery left for the time being was the

Cabinet itself. There was formed, however, on 5th August, a Sub-Committee of the C.I.D., which was given the name of "Joint Naval and Military Committee for the Consideration of Combined Operations in Foreign Territory." It consisted of representatives of the Admiralty, War Office, Colonial Office, India Office, and others, and was presided over by an Admiral. This curious Sub-Committee disappeared in November, 1914, when a War Council of a few Cabinet Ministers was created. This was replaced the following May by the Dardanelles Committee of about a dozen Cabinet Ministers, and this in its turn gave way at the end of the year to a War Council.

Besides these various bodies, Departments of State had acquired during peace the habit of having wars of their own, and this was continued in the Great War, the result being that by the Spring of 1915 we had the following situation :—

The War Minister, supported by most of the soldiers, was striving for decisive results on the Western Front. The First Lord of the Admiralty was initiating an expedition for the capture of the Dardanelles and Constantinople. The Secretary of State for India was conducting a campaign in Mesopotamia, with Baghdad as the objective. The Secretary of State for the Colonies was concerning himself with several little wars in Africa. Finally, the Chancellor of the Exchequer was endeavouring to persuade his colleagues to withdraw the whole of the Expeditionary Force from France and send it to the Balkans.

What price had to be paid in the shape of lives and money for this state of affairs must remain a matter of speculation and we can only hope not to see the like again.

I understand that the lecturer thinks that the creation of a Minister of Defence would materially help towards the more efficient conduct of operations in future. The only observation I will make on that point is that so far as I am aware no one ever suggested during the War that the appointment was necessary. During the first year and a half I was frequently summoned from France to attend Cabinet Meetings, and from December, 1915, to February, 1918, I attended these meetings practically every day in the week except on Sundays. Many difficulties and anxieties had to be faced in those days, but I have no recollection of anyone suggesting that a Minister of Defence was required. The reason for that may be that we all came to realise, in a way that we had not done before, that war is not nearly so much a matter for soldiers and sailors alone as soldiers and sailors sometimes think. On the contrary, it embraces all the activities of the Nation, and decisions must ultimately be made by the head of the State—the Prime Minister. Whether a Minister placed in charge of the three fighting Services would be of any assistance to the Prime Minister, or whether he might not be rather more mischievous than useful, is a matter that requires careful consideration.

The whole subject is, as I have said, a very vast one, and I feel sure that you will wish me to convey to Sir John Davidson your thanks for the trouble he has taken to prepare and give us so interesting an address.

A resolution of thanks was conveyed by acclamation.

ADMIRAL SIR R. G. O. TUPPER: Ladies and Gentlemen,—It is my very pleasant duty to have to propose a vote of thanks to our very popular Chairman this afternoon, but as no naval officer has emphasised the urgent necessity of having sailors in the air to work with sailors on board ship, I should just like to refer to that little point in this masterly lecture, and to say that I cordially agree with Sir John Davidson that it is necessary to have men trained as soldiers to

work as soldiers between the air and land, and also absolutely essential to have sailors in the air to work with sailors on board ship. Now, I ask you to join with me in a very hearty vote of thanks to Sir William Robertson for coming here to-day and giving us the pleasure of presiding over this meeting.

The motion was carried with acclamation.

THE CHAIRMAN: I thank you, very much.

THE CORPS OF COMMISSIONAIRES

By LIEUT.-COLONEL ALBAN WILSON, D.S.O.

THE Corps of Commissionaires was founded in 1859, by the late Sir Edward Walter, with the intention of providing suitable employment for wounded pensioners of the Army and Navy.

The Crimean War, followed by the Indian Mutiny, left many maimed and disabled men to get through the rest of their days as best they could. The position of the ex-Service man was a standing reproach to his fellow countrymen, for, beyond giving him in some cases a small pension, Government could, or would, do nothing to help him; the public fought shy of the soldier, as it always has done, except when there is fighting in progress.

Captain Edward Walter, who had but recently retired from the 8th Hussars, had acquired a deep knowledge of human nature in general and of the character and capability of the British soldier in particular. The old regimental system, when the man was taught to look on his unit as his home for the best part of his life, had a peculiar fascination for him, and he felt that when the man's active career was over, the discipline and training he had received should be recognised at its proper value in civil life.

Like Ecclesiasticus, his heart was grieved at "the sight of a man of war in poverty," and hating the idea that an old warrior should have to live on charity and go about begging, he set to work to find situations for any who could be employed.

He got work for seven, each of whom had lost a limb, put them into uniform, and on 13th February, 1859, took them to Westminster Abbey to render thanks to God that they no longer had to endure a life of poverty and idleness. One of these veterans was William Turner, who as a bugler of the Coldstream Guards had helped to defend the Chateau of Hougoumont, during the battle of Waterloo.

So much support was received from his relatives and friends, as well as from *The Times* newspaper and employers, that six years later the founder decided to extend his scheme, so as to include able-bodied pensioners as well, provided they were of good character, and now the Corps consists of over 4,650 members.

Sir Edward Walter died in 1904, and was succeeded in the command of the Commissionaires by his nephew, Major F. E. Walter, M.V.O., whose remarks, when, in 1909, he addressed the men on the fiftieth anniversary of the Corps' foundation, might have been made to-day, they are

so applicable to present conditions. Commenting on the Founder's scheme, he said : " It meant thrift and self-help, involving some self-denial and so much discipline, as is requisite for any society organised on a military system, but it was the way to the confidence and esteem of the public and, as such, it commended itself to officers and men alike, and, what was of equal importance, to a great number of employers, on whose recognition its success depended. When to-day we measure that success, we find it remarkable indeed. Best of all, our members enjoy the respect of their fellow citizens throughout the country. H.M. King Edward himself described us as being one of the best regulated and most useful institutions in the country. Sir Edward Walter had great difficulties to overcome and for many years the arch-enemy was intemperance. Happily we can say that intemperance has been moribund in the Army and the Corps for the last twenty years. Intemperance has, for some time, appeared in a very violent form in the language of people, who want to turn our whole social fabric topsy-turvy, and our present trouble is that the Commonwealth is suffering from shock to its nervous system with partial paralysis of private enterprise. This is the chief cause of unemployment and of complaining in our streets. Happy will be that statesman, who shall restore confidence and attract the tide in the nation's affairs from ebb to flood again. Whatever changes time may bring to pass, I am confident that, so long as the Army and Navy exist, the members of this Corps will maintain and extend the honourable reputation they have gained, and the best hope I can express for their future is that they will be true and just in all their dealings, diligent in the work appointed for them, and temperate in all things, and that they will teach their children to fear God, honour the King and love and serve their Country."

Now-a-days, the public has, or should have, a truer estimation of the old soldier's character than it had then, if it remembers how he and the sailor stood between our country and ruin in the dark days of 1914, before the nation realised what we were up against, and it remains with our present day Army and Navy to make that estimation one of increasing respect.

It is therefore regrettable that some employers are annoyed at the way many an ex-Service man has of expecting that, because of what he has been, others should maintain him without receiving a fair equivalent of his labour in return, and they dislike the way he has of leaving his work without giving them due notice. If the ex-Service man would only realise that by such behaviour he destroys the chance of his comrades' future employment ; if people could say : " We like to employ the ex-Service man because he plays fair and never lets us down," what a difference it would make.

The Lord Mayor of London, when inspecting the Corps in 1911, said : " The qualities most prized in commercial life are honesty, sobriety, punctuality, discipline and general trustworthiness, and those

men who best display those qualities are the most valuable to civil employers. For industrial purposes, the steady persistent well-doer, who has preserved a blameless character throughout his service and won the good conduct medal, would be more attractive to a commercial employer than even the man with a decoration for great courage in the field. In working on these lines you are not only taking the surest way to obtain and retain employment, but will favourably impress your employers with the soundness of the training given in both branches of the Service. Let your conduct be such that when civil employers require well-disciplined, honest, sober, punctual, trustworthy assistants, they will unhesitatingly turn to the Corps of Commissionaires in full confidence that they will there find the help they require."

These words of Sir Vesey Strong, a man who was born and bred in the heart of the Empire, express the lines on which the Corps works, with the mottoes on its badge of merit: "*Virtute et Industria. Labor Omnia Vincit.*"

There is probably no other institution like this in the world, and it was founded on the love one soldier bore for his old comrades who had "done their bit." To-day, amongst its Governors, there are no less than eight who bear the Founder's name.

The qualifications required of a candidate for enrolment are, that he must have served in some branch of His Majesty's Regular Forces and be in receipt of a pension, but no one will be taken, unless his character bears the strictest investigation. Under special circumstances a man under thirty years of age, who has completed his limited engagement, or whose temporary pension has expired, or a man of the Territorial or Colonial forces, who has been injured on duty and receives a pension in consequence, will be admitted under the same conditions as a regular. Every man on joining must make a deposit in the Savings Bank, varying from £5 to £25, according to his rank on discharge from the Service; so it must not be imagined that this Corps is intended as a refuge for the destitute and work-shy, who cannot obtain subsistence elsewhere, but it is for encouraging the thrifty and industrious. On engagement each man must sign a statement that he understands he will depend on his own efforts for remuneration, that he agrees to certain very moderate charges for uniform, rent of quarters, if provided with them in barracks, to fines for damage caused to his employer wilfully or by neglect of duty, etc., and to pay his accounts regularly, and in return the Corps undertakes to recommend him for such employment as may be available, and for which he is suitable.

The employer also signs an agreement, which sets forth the nature, period and payment of the work he offers, what notice is to be given of its termination and the amount of security the Corps undertakes for its Commissionaire's honesty. This form is signed by the man himself as well. Further, on signature, the Corps agrees that in the case of illness of the man, it will provide a substitute, without expense to the

employer, and, in event of the man's death, the employer is not asked to contribute towards support of his dependents.

Each member must deposit at least one shilling a week from his earnings in the Savings Bank, in addition to his original deposit, and three per cent. per annum is allowed on the account, which may not exceed £200.

Small pensions are given, according to length of Corps service, to those who join the Pension Fund, or else gratuities where members resign or are discharged for age or ill-health. A Sick Fund has been established for the benefit of members of the Corps, in order to provide them with relief in time of sickness, and for their funerals in case of death. Their wives and children can also receive medical attention on payment of a very small extra subscription.

Employment is arranged according to the intellect and physical capability of the man desiring it. He can be a watchman, invalid's attendant, guide or caretaker, to mention some of the billets suitable for single men. Married couples without families can sometimes be found, who will enter domestic service together. Wages are settled according to the nature of the work, for instance, the charge for a sick attendant is 7s. a week, for a night watchman 10s. a night, a man meeting children going to school and seeing them and their luggage across London costs 5s. 6d., plus out of pocket expenses. In short, the Commissionaire is sure of receiving the full market value of his work and is enabled to make provision for old age, as well as for those he will some day leave behind.

There has seldom been any difficulty in finding suitable employment for an old soldier or sailor, for, if he acts up to the principles of his calling, he is a much better man than one who has not had the advantage of his training. There is not a single branch of the Services which is not represented in the Corps of Commissionaires.

In 1864, the Founder instituted an "Officers' Endowment Fund," to provide for the salaries of the officers of the Corps. The pay of the non-commissioned officers and all expenses of administration are defrayed from the annual subscriptions of members. No casual contributions are received from outside sources, nor are donations accepted, which come from concerts or any other sort of entertainment, public or private. In short, the Corps never "sends round the hat." No person can be a member of the administrative board unless he has served as a regular officer and has qualified as a life governor.

The only form in which outside help is received is that a donor of £10 to the Officers' Endowment Fund becomes a life governor and an annual subscriber of £1 also becomes one after ten years.

In 1883, an appeal was issued to the officers of the Army to the effect that if every Battalion and unit subscribed £2 annually, the Committee of Administration would not have to encroach on their

invested capital to meet working expenses. The response to this appeal was so universal that at the present day there is scarcely a unit at home or abroad that does not contribute to the Officers' Endowment Fund.

Besides the regular subscriptions, the Institution has received two large donations, one of £10,000, which was the unexpended balance of "The Times Crimean Fund," and a gift of £7,000 from the late Marchioness of Winchester, which, with a few other donations and legacies, produce a fixed annual income of approximately £1,500 a year, and a similar amount is realised from the average annual subscriptions to the Officers' Endowment Fund.

The funds of the Corps have been invested in freehold and leasehold property in the Strand, and barracks to accommodate one hundred and fifty men have been built, with bathrooms, canteen, recreation room, billiard room, etc. The charges are extremely moderate, not more than five shillings a week for a single furnished room, so they are in constant demand in these days of high rents.

As time went on, and the success of the Corps in London seemed assured, the Founder turned his attention to carrying his work further afield, and commenced by establishing a Division at Belfast, to be followed shortly by other Divisions at Nottingham, Liverpool, Glasgow, Manchester, Edinburgh, Leeds, Birmingham, Cardiff and Bristol. Nottingham has, however, been merged into one with Birmingham and Cardiff with Bristol.

The Founder, who received the honour of Knighthood in 1886, sailed for Australia in 1887, *via* India, but owing to family reasons was recalled from Colombo. Major Hawkins, a valued member of his staff, went on to Sydney, and commenced operations with some thirteen men, whom he took with him, being strongly supported by H.E. The Governor of New South Wales, the Earl of Jersey; but for various reasons, principally the hostility of the Trades Unions, the experiment failed after over eighteen months trial, and Major Hawkins and his party returned to England.

History has repeated itself in the hostility of the Trades Unions in England towards the ex-Service men after the late War.

On 1st June, 1925, the Corps consisted of 536 men from the Royal Navy and Royal Marines, 541 from the Cavalry, 1,180 from the Royal Artillery, Royal Engineers and departments, and 2,382 from the Infantry of the Guards and Line.

Anyone desirous of learning more about this excellent organisation can get full particulars from the Adjutant of the Corps of Commissioners, Exchange Court, 419a, Strand, W.C.2.

The writer wishes to acknowledge the assistance he has received, in compiling this article, from *The Times* newspaper and from the Secretary of the Governors of the Corps, besides the Editor of this JOURNAL.

THE EVOLUTION AND CONSTITUTION OF THE INSTITUTE SERVICE.

By PROFESSOR ERIC SHEPHERD.

INQUIRY at a celebrated London reference library having wholly failed to produce any treatise or monograph dealing with the history of canteen organisation in past times, it may reasonably be assumed that no such work exists—because no such thing existed. Only of recent times has the provision of canteen facilities become a military matter at all. Though very close and curious research into the records of different periods might afford some sort of basis for, at any rate, interesting speculations as to systems of old, the chances are that the soldiers of most historic armies were left to solve the canteen problem each man for himself, either through the pedlars who followed the march of the host, or through looting an enemy territory, or again, by the effect of a personable figure in handsome regimentals upon the susceptible heart of womankind. It was probably felt of old that the soldier who could not supply his wants in one or other of these ways deserved to go without.

Only comparatively recently, then, has the provision of canteen facilities come to be reckoned a necessary adjunct of military organisation and preparedness. How recent the development is may be judged from the fact that the Princess Alexandra came to England to be married, and the canteen question first arose in an acute form, at almost the same time. The soldiers who lined the routes at the late Queen-Mother's wedding were the very same who had just successfully rebelled against the only canteen system then known, which consisted in licensing a local tradesman to enter barracks and set up shop there. The reason for the revolt had been the impudent extortions of the licensees, who well knew that their customers had no resource against them except the heroic one of going without beer. It is from this refusal of the Army in 1863 to pay any longer through the nose for what they passed down their throats that canteen history may be said properly to date.

We do not know whether the Princess Alexandra ever overheard her royal and regnant mother-in-law discussing the problem which had arisen in the Army, but we do know what was the outcome of discussions which must certainly have taken place. The pedlars having brought about their own expulsion, a system was devised whereby the various units were to conduct their own canteens or institutes, through a race of canteen-stewards, usually pensioners, who, under the nominal supervision of the commanding officer, were commissioned to buy and sell, and generally undertake the matter, on behalf of the battalion. Needless

to criticise this expedient at length ; its inherent weaknesses are obvious. The pensioner-stewards soon discovered numerous ways of enriching themselves ; they developed " understandings " with supply firms, and bought third-rate goods which they sold at first-rate prices. Accommodation for them other than the storehouse there was none ; they flourished there in full strength by day and by night retired under the counter.

These stewards, however, were maintained without alternative until within the last decade of the nineteenth century ; but then the unsatisfactoriness of the whole system, together with its numerous inevitable abuses, could no longer be ignored. A commission of inquiry was set up, and the result was the institution of the *tenant system* of canteen management, whereby Commanding Officers might, if they liked, let the institute for which they were responsible, to outside contractors, who on their side put in a staff, and paid rebate on turnover. The rate of rebate was to be negotiated between the Commanding Officer and the firm, generally a far from equitable arrangement ; and, as the contractors were under no sort of obligation, they naturally objected to dealing with small units or those stationed in inaccessible places, which thus, in very many cases, had to carry on under the older system of canteen-stewards. Neither contractors nor stewards were subject to any more expert control than that of the Commanding Officer, through his deputies. The quality of goods remained wretchedly low, and bribery and corruption flourished.

Bad enough in peace, how much worse was this provision in time of war ! Yet the Army set off for South Africa with nothing better. Things would have gone hard with our forces in that campaign, had not Sir Redvers Buller, a genius at organisation, and with a constant solicitude for the men under him, improvised an emergency canteen system, of which it is enough at this stage to say that it was both in principle and method almost exactly the same as that which a greater emergency was afterwards to establish generally. After the war Sir Redvers Buller's system was maintained in South Africa for the benefit of the garrison, and it served as a useful object-lesson at the outbreak of the Great War.

Whatever dispute there may have been as to our cause in South Africa, all are agreed that the campaign with its numerous salutary disasters, proved of value in opening the eyes of authority to the many deficiencies of our military organisation. Among other commissions of enquiry which sat afterwards was one, under Earl Grey, appointed to reconsider the canteen problem in the light of recent events. The most important recommendation of this body was that Commanding Officers should be encouraged to hand over the management of institutes to some form of soldiers' co-operative society, duly registered under the Industrial and Provident Societies Act. But Army contract was too profitable to be lightly let go by those who engaged in it on the existing

systems ; and this recommendation of the commission met with the strenuous and successful opposition of interested parties. All the commission effected was a certain *revision* of the *tenant system*, whereby contract for the institutes was limited to the larger and more established contracting firms ; an innovation whereof the efficacy may be inferred from the fact that, shortly before the outbreak of the Great War, a gross canteen scandal, involving a well-known firm of contractors and a number of soldiers, led to a prosecution at law, and to very general public indignation, which *The Times* summed up as follows :—

“ The time has manifestly come when the whole of the present canteen system, under which abuses and misfeasancess of the kind disclosed in this trial have grown up and flourished should become the subject of searching investigation on behalf of the Government.”

This revelation led to the appointment of another commission—that of Lord Rotherham, with Lord Leverhulme, Sir R. Burbidge, and others as members ; but it had hardly got to work when the Great War began.

As before in the Boer War, so now again, the British Army set off for the front without any official canteen organisation at all. Even as late as August, 1915, a year after the outbreak of war, the troops in Gallipoli suffered greatly through the lack of such a service, of the need and vital importance of which the medical authorities were unanimous and emphatic. Local traders were at first encouraged, reverting to a very old makeshift ; but, as was to be expected, many of them became secret enemy agents, and the use of them had soon to be abandoned. The Commander-in-Chief, meanwhile, was making constant appeals to the War Office for an official and efficient canteen service for the comfort of the men in the field ; but the temporising and tinkering policy of years was now to show its results ; there was no war organisation in existence, neither were there any funds, wherewith the appeals of the Commander-in-Chief could be immediately met.

The *idea*, however, of an efficient canteen service applicable to modern war did exist—had long existed, in the minds of certain constructive thinkers. The idea was not to seek, but funds were lacking ; and hence it was not until early in 1915 that the *Expeditionary Force Canteens*, the new organisation, was authorised to take the field. £10,000, afterwards increased to £37,000, taken from credits standing to the account of the South African Garrison Institutes (referred to above), formed the initial capital of an organisation which was to assume truly colossal proportions ; and later the urgent need of more capital was met by bank overdrafts, and finally by loans (at interest) from the Treasury, amounting in all to £720,000.

The effect of the new organisation in France was instant and interesting. Until its arrival prices in French and Belgian shops had

risen 50 per cent. at sight of a British uniform. It may be imagined with what satisfaction the advent of the E.F.C. was hailed by the British Army.

Meanwhile, at home, the contractor system had failed to cope with the swarming millions of the New Armies. So much so that, in December, 1914, on the strong recommendation of Lord Rotherham's Committee, a board of control was formed of military and civilian membership. This board, after thoroughly reviewing the whole system, recommended, in October, 1916, that the tenant system be finally abolished, and its place taken by a central organisation or incorporation of the Army itself for trading purposes working on a non-profit-taking basis.

As a result of this recommendation, the following year, the board developed into the Army Canteen Committee, which included among its members Sir Alexander Prince and Mr. F. Benson, both of whom, besides being the organisers of the E.F.C., had had many years pre-war experience of canteen organisation.

It should be noted in passing, that the new principle of canteen and institute organisation was first put into *practice* (it had existed as an idea for some time) in an hour of great emergency, when people for once were genuinely trying to think, not how little they could decently do for the soldier, but how much, and how well, and how soon. The new organisations represented, both in principle and method, the conclusions of the best and soundest thinking on canteen problems; and the task of translating the thought into action was, in many instances, most happily entrusted to those responsible for the original ideas. The soundness of the underlying thought was quickly proved by the successful working of the extemporised organisations over ever-widening fields and expanding ramifications.

The length of such an article as the present has necessarily excluded any detailed reference to Naval canteen history, but it may be mentioned, in passing, that the development of unofficial canteen enterprise in the Navy had grown to undue proportions with the usual accompaniments of abuse and corruption, and it was decided on the recommendation of a committee appointed in 1905, to bring Naval canteens under official recognition, and to develop the tenant system under Admiralty supervision. This system, like that in the Army, broke down under the continued stress of war conditions, and in 1917 the Royal Navy decided to join forces with the Army in the new canteen organisation which thereafter became known as the *Navy and Army Canteen Board*. The N.A.C.B. took over canteen work in Egypt as well as at home. The capital required for the business was found by overdrafts on the guarantee of the Treasury, upon which interest was paid—which, moreover, have since been entirely refunded. In 1918 the Royal Air Force also accepted the services of the N.A.C.B.

After the War the *Expeditionary Force Canteens*, a purely war-time organisation, which had served the Armies with entire success in France,

Italy, Salonika, Mesopotamia and elsewhere, naturally went into liquidation; and in July, 1919, the *Navy and Army Canteen Board* took over all E.F.C. canteens still functioning—as, for instance, in occupied Germany. To the N.A.C.B., moreover, was entrusted the considerable task of liquidating the assets of the wartime canteens and realising the profits.

The profits of the wartime canteens had been declared at a certain figure; but, when it came to a practical question of liquidating the assets, consisting of plant and stores, etc., all over the world—more especially as this task had to be performed under every conceivable disadvantage at a time of unprecedented world-wide confusion and upheaval—the N.A.C.B. found it impossible to realise the paper figure. This partial failure, though natural enough, soon gave rise to a report that the N.A.C.B. had shown culpable negligence, and even “misfeasance,” in the matter; and it was not long before the wiseacres were telling each other that the old canteen spirit was still alive. An official enquiry into these reports, conducted by commission with Lord Banbury as chairman, exonerated the N.A.C.B., to the full satisfaction of all who troubled to follow the evidence, but the number of these was, of course, inconsiderable in comparison with those who had heard the rumour and at once prejudged the case. It is still believed by some that the N.A.C.B. frittered away about a million through bad business, and pocketed in sheer turpitude about a million more. Readers interested in the detailed facts may be referred to the full report of Lord Banbury’s commission.

Another point which arose after the war was whether the new canteen system as represented by the N.A.C.B. was to be maintained as the permanent service in peace, or discarded in favour once again of the contractors. The contractors themselves were understood through their representatives in Parliament to be strongly in favour of the latter alternative; but, in March, 1920, a committee which had been appointed to enquire into the matter, unanimously recommended that canteens for the three Services—or “institutes,” as it was decided henceforth to call them—should be administered by a joint organisation, or incorporation of the three Services themselves for domestic trading purposes, to be styled the *Navy, Army and Air Force Institutes*. Accordingly the existing N.A.A.F.I. came into formal existence on the 1st January, 1921. Later, on the 14th May, 1921, a committee of the House of Commons, with Sir Samuel Roberts as chairman, reported on the principle involved by the existence of the N.A.A.F.I., in the following terms:—

“From evidence that we have heard we are convinced that the maintenance of a permanent organisation of the kind is most desirable as a matter of policy, both because of the amenities it affords to members of the Forces, and *more especially because it provides the nucleus of a service capable of immediate expansion on mobilisation.*”

(The italics are the present writer’s).

To sum up this branch of the subject, it will be seen from the foregoing statement of facts that all attempts to meet the needs of the Services through civilian contractors have worked out disadvantageously to the men, and in time of war have broken down altogether. It will be seen that no fewer than five successive committees—Lord Grey's in 1902, Lord Rotherham's in 1914, Army Canteen Committee in 1916, Inter-departmental Committee in 1920, and Sir Samuel Robert's in 1921—have all strongly recommended an organisation based on the principles of the existing N.A.A.F.I. as being best calculated to supply the needs of the Forces in war and to safeguard their interests in peace.

It is widely supposed, however, and made into a considerable grievance, that the surplus funds of the war-time canteens, which it was understood were to be for the benefit of the ex-Service man, are in fact still in the hands of the N.A.A.F.I. How otherwise, it is sapiently urged, could so extensive a business carry on? This curious error is not confined to civilians, but crops up repeatedly in the Services themselves; wherefore it would certainly appear desirable to advert to it here. However ridiculous, such prejudices do the N.A.A.F.I. a certain harm, and to hinder the workings of an organisation which functions exclusively for the Services is to postpone its benefits.

It has been shown already that the liquidation of the assets of the war canteen organisations did not result in as much as was estimated upon paper. The loss was not so great as is sometimes supposed, but there was a loss. A very considerable sum, however, was realised out of the wartime canteens, and this considerable sum was duly disposed of by special Act of Parliament—*War Service Canteens (Disposal of Surplus Funds) Act*—in 1922.

As has been said, it was understood at the time that the surplus funds—or profits—of the wartime organisation would be employed mainly for the benefit of the ex-Service man; and this Act of Parliament did, in fact, so dispose of them, by making over the greater part to the United Services Fund, which received in all £7,200,000 odd from the war canteens surplus. This sum has now been paid over to the last penny; and—except for a few colonial and departmental reservations, and an amount estimated at approximately £350,000 left in the liquidation account as the assets on which the N.A.A.F.I. started its operations—this was the total of the surplus funds actually realised upon the assets of the E.F.C. The impression that the N.A.A.F.I. had this money, and was keeping it, is probably traceable to the fact that the N.A.A.F.I. did have the possession and the use of it previous to its disposal by Parliament.

So much for that. It now remains to say something briefly about the constitution of the N.A.A.F.I. itself, and, that done, this first essay into an obscure sphere of military history may be held to be done, too.

Legally, the Corporation of Navy, Army and Air Force Institutes is a company—registered under the Companies' Acts as trading not for

profit ; that is as much as to say, it has no shareholders and does not pay dividends. More explicitly, it is an *incorporation of the three Services themselves* for the purpose of transacting their own domestic trade. It is a service *of* the Services *by* the Services *for* the Services. A glance at the constitution of the business will make its identity with the Services perfectly clear.

The control of the N.A.A.F.I. is vested in a *Council* and a *Board of Management*. The Council is composed of twelve members of the Services, in the proportion of four from each Service, appointed for a term of office by the Service Departments of Government. These members are unpaid, and their function is to determine the policy of the business in accordance with the wishes of the departments they represent, viz., the Admiralty, War Office and Air Ministry respectively.

The Board of Management, which is the executive body, consists of one Naval, one Army, and one R.A.F. representative, supported by three civilian members with business experience. The Service representatives upon the Board receive during their period of service the emoluments to which their rank in their respective Services entitles them. Everybody else in the business, from the general manager down to the messengers, is simply a person employed by the Services incorporated, at a salary approved by the Board of Management. *Nobody*, apart from the men of the Services themselves, has any financial interest in the business at all ; the troublesome element of private gain has been entirely eliminated.

Nor is this Council and Board of Management at all autocratic or absolute. The ideal is to give effect as far as possible to the wishes of every individual Service man. Machinery exists whereby every regiment or group can have its own institute committee to deal with matters on the spot ; and this committee sends a delegate to a higher committee consisting of representatives from each unit in a command ; which, again, sends a delegate to the general committee of each Service, meeting periodically to advise the board and lay before the Services incorporated the views and wishes of the individual Service man. Thus democratic control is secured through a system of parliaments ; and thus the important fact is brought home to each Service man that he himself through his representatives has a voice in every decision which is taken by the Services as a whole.

As to what becomes of the surplus funds or profits of the N.A.A.F.I., that may be illustrated in the following way. The Service man of to-day walks into a clean, bright, well-appointed institute and orders what he fancies to eat and drink from a considerable bill of fare. Of what he pays for his meal—and he pays no more, but probably rather less, than he would have paid in a similar restaurant elsewhere—the greater part simply covers the cost of what he has had. Of the remainder (what would be called "profit" in an ordinary establishment), a percentage comes back to him as a member of his unit in the form of rebate paid

to his institute funds, and the rest, after the necessary reserves have been made, is expended for the benefit of the Service as a whole in schemes for the general improvement of Service conditions (for example, the N.A.A.F.I. is at present engaged in refurbishing the institutes) arrived at in consultation with committees consisting of Service representatives delegated by the various commands.

If he goes into camp, an institute under canvas will be run up for him, where he will be as well served in every respect as in barracks or at home. On the march a mobile canteen will attend him. Abroad, wherever the N.A.A.F.I. is called upon to function, the same facilities will be afforded him as in this country; even though, owing to its smallness and distance, the institute has to be run at a loss. In the event of war the institute organisation is capable of financing and providing the organisation to meet any emergency, and for the first time in our history an efficient canteen service would be ready to take the field at the same time as the troops.

CONTROL OF RADIO-TELEGRAPHY IN TIME OF WAR

By COMMANDER JOHN A. SLEE, C.B.E., R.N.

THE growth of broadcasting as a general, almost as a national, amusement has entirely changed the position of affairs as regards the control of radio-telegraphy in time of war. Twelve years ago the only form of detector in common use was the crystal. The three electrode valve was almost unknown, while other forms of detector were scarcely used; they were, indeed, little, if any, better than the crystal. Again, the only transmitter in general use was of the spark type; the use of arc generators of continuous waves was very restricted, and as wireless telephony was, and is still, impossible with spark transmitters, communication could only be carried out by means of the morse code. Finally, the comparatively insensitive crystal detector of those days demanded a good-sized external aerial if reception at any considerable range was desired. Transmission was thus only practicable with a large and very obvious aerial, while the lack of anything except the morse code as a medium of communication, restricted radio-telegraphy as a hobby to a very limited number of enthusiasts and to a very small number of physicists and research establishments experimenting in wireless.

Under such conditions, when only a few persons were interested in the subject, and it was necessary to employ a large and easily visible aerial, either to send or to receive, it was feasible to keep track of every person licensed to possess a wireless receiver or transmitter, and so to discover any who made use of unlicensed apparatus. It is true that there always existed the possibility of concealing an aerial inside a building, especially if it were only intended for reception, but, except for this or similar methods of concealment, there was no difficulty in enforcing legislation demanding that in wartime all wireless apparatus of every kind in private hands should be completely dismantled, and it could then be assumed that the entire use of wireless would be under the complete control of duly constituted authority.

But now any such form of control has become impossible. The free use of valve receivers by so large a percentage of the population makes it impossible to keep track of every user, and the extreme sensitiveness of modern apparatus makes the use of external aerials quite unnecessary. Not only so, but the necessary small frame aerial can be completely concealed in any piece of furniture. The remainder of the receiving apparatus can be hidden piecemeal, so that even a house-to-house search may fail to discover hidden wireless receivers capable of taking in morse signals coming from huge distances. Further, the

extreme sensitiveness of the modern receiver makes it possible to cover enormous distances with transmitters of very small power and size, especially if short waves are employed, and such small transmitters can be concealed with hardly more trouble than receiving sets. It is true that an aerial of reasonable dimensions is still necessary, but forty or fifty feet of single wire can be handled so easily that it can be put up after dark, when it would be almost impossible to detect its presence, and hauled down before daylight. Consequently, since it is nowadays impossible to make certain that all wireless receivers can be suppressed at will, it is useless to try to do so at all, as it is certain that evilly-disposed persons of sufficient importance to be a national danger will have the best technical knowledge at their disposal, and can, therefore, be assumed not only to possess the highest class of receiver, but also to have concealed it in the most ingenious way. It can therefore be stated with all certainty that twelve years ago it was a practical proposition to prevent any unauthorised message from being received in a country, or transmitted from it or in it; while to-day it is quite impossible to prevent any technically competent person from keeping in concealment sufficient apparatus to permit of the transmission or reception of messages over very great distances. Such apparatus could be brought into action and hidden away again very quickly, and being silent in operation, its use would be almost impossible to detect except by wireless methods. Of course, if such illicit messages were made, it is unthinkable that the authorities of any civilised belligerent state would not immediately become aware of the fact, and, unless such messages were very short and very rare, the station would be located and rounded up very quickly.

Nothing approaching to free communication could be established, but the possibility of transmitting one vital message remains. On the other hand, it is quite impossible to prevent the free reception of illicit messages within a belligerent state; indeed, the only restriction on such traffic lies in the certainty of any code that could be used for such a purpose soon becoming known to the authorities, and thus supplying as much or more information than the illicit station could hope to receive.

It has been stated above that great ranges can be covered by very small and easily hidden apparatus—witness the recent experiments carried out by the amateur wireless societies of various countries—but such a service cannot be called a reliable telegraphic service. It is by no means certain that any short and isolated message, sent only when some grave crisis arises, and without the possibility of keeping constant touch, will ever reach its destination.

To ensure a certain, reliable, service, large and powerful transmitting stations are required, and such things cannot be constructed in secret or kept hidden. Although, therefore, it is certain that an illicit service from a country cannot be prevented, yet such a service is not likely to be reliable and it must be extremely restricted in its uses, since, if used at all, except in the most sparing fashion, it will very shortly be located

by direction finders. In a country such as ours, with a considerable distance between our own territory and that of any other power, the difficulties in the path of any illicit transmitting station remain considerable. Where territories adjoin, and ranges are therefore short, the conduct of an illicit station becomes easier, because less power is required, and a more careful watch must be kept to detect its presence and determine its locality. It is clear, then, that even in these days of small and easily-concealed transmitters and receivers, it is not altogether an easy business to establish and maintain a reliable illicit service, nor is it very easy to see to what use so very restricted and doubtful a line of communication can be put.

From a military point of view it must be admitted that, since it is impossible to close down all private reception, it is no use to close down stations belonging to obedient and well-disposed persons, while leaving those whose owners are of the reverse disposition. This new means of communication must consequently be accepted, and since it cannot be prevented, the best possible military use must be made of it. There can be no difficulty in the control of the regularly-established broadcast transmitting stations of any country; it is purely a matter of well-organised censorship.

Every recipient of broadcasting programmes knows to his cost how wide an area can be disturbed by the oscillation of even a single receiver, and it will thus be impossible to prevent ill-disposed persons from occasionally breaking into a broadcast programme with anti-patriotic propaganda, although such attempts can only affect a small area.

So it would seem that in the event of war the skilful use of the machinery for broadcast programmes might prove to be of great national value. Short remarks by the national hero of the hour, heard simultaneously in the majority of the households of the country, would have a great moral effect, and would do more to restore confidence in times of stress or inspire further effort in time of victory than any written word could possibly achieve.

There remains another aspect of the use of broadcasting in wartime, and that is the effect on other countries, neutral or hostile, of the programmes broadcast by a belligerent. It is well known that the programmes of several nations can be picked up, and as this cannot be prevented, its effects must be calculated and allowed for. The possibilities of propaganda in an extreme form seem almost endless; civilization seems to have swung back to the days when a herald could by word of mouth address remarks to an army or to the inhabitants of a whole town. A war of tongues seems inevitable, and the volume of impassioned harangues and counter harangues addressed by the great orators of both sides, to friend and foe alike, may reach a level never before attained in the most fiercely contested election. No doubt this new element in war would shortly counteract itself, as has been the case with most new weapons, probably because both populations would cease to listen

to such outpourings. Nevertheless, so potent a means of working on the morale of belligerents and exciting the sympathies of neutrals cannot be ignored in any future war between civilised countries.

It does not seem that the recent advances in radio-telegraphy or telephony, as applied to broadcasting, will make any great change in warlike conditions, except for the power of addressing whole peoples at once. But this power of addressing a nation can only strengthen any strong government, and still further increase the influence of a popular government, and finally prove a powerful lever with which to hasten the break-up of any State the morale of whose citizens has begun to crumble. It is eminently the weapon of the strong, another factor in favour of the winning side, the means by which it is able to operate being through the mentality of the entire civilian population.

In all probability the greatest effect on hostile populations will be secured by indirect means. If a belligerent maintains a steady service of good and cheerful programmes, avoiding all sensational announcements, and skilfully avoiding any demonstrable untruth, the apparent high spirit and confident manner of that population will probably exercise a greater effect on a less confident nation than any direct statement addressed to them or obviously intended for their attention. A nation possessing well equipped and powerful broadcasting stations will thus possess a great advantage over a state not so well provided, and broadcasting transmitting stations will, therefore, probably become targets for attack after hostilities have commenced, both by direct warlike action and by enemy agents. Numerous stations of smaller power may be equally effective as far as the distribution of news or speeches to the population of one country is concerned, but when it is desired to address the population of another country the advantages of the powerful station become obvious.

A highly developed broadcasting organisation will therefore prove advantageous to a state in time of war; it can only prove disadvantageous to a state that is liable to civil commotions. The internal communications of rioters may be maintained with ease by means of wireless, whereas they could only be maintained with difficulty, if at all, by other means. In such cases the influence of broadcast speeches will be even greater as there will be no restrictions imposed by differences of language, while ranges will be less, and so a great advantage will lie with the party which holds the broadcast transmitting stations in its power. This point of view serves to emphasise the previous remark that a well-found and properly equipped broadcasting organisation will assist any combatant state in which the morale of the civilian population is good, and where patriotism runs high, while it may become a powerful weapon against any state divided against itself or one in which national confidence is ebbing, or whose population has been forced or beguiled into war by an unrepresentative or unpopular government.

THE LOSS OF THE "REVENGE."

By COMMANDER W. CHARLES CASTLE, R.N.

THE "Revenge," built at Chatham by Sir John Hawkins, was a vessel of about 500 tons, and carried between thirty and forty guns on two decks. Sir Francis Drake used her as his flagship during the fight with the Spanish Armada in 1588.

On the morning of the 10th of September, 1591, Lord Thomas Howard was lying in a small bay on the east side of the island of Flores, in the Azores. He had under his command, his flagship "Defiance," "Revenge"—flying the vice-flag of Sir Richard Grenville—"Bonaventure," "Lion" and the barque "Raleigh," and two small ships, the "Foresight" and "Crane," besides six victuallers.

This small squadron had been in the Azores for some months, with the object of capturing the treasure fleet, which was hourly expected to arrive from Havanah on its way to Spain.

The safe arrival of this treasure fleet was of the greatest importance to the Spanish king, for, despite the utter defeat of his Armada of 1588, he was determined to fit out a similar fleet for the conquest of England, and Spain being a very poor country, he needed the riches of this fleet, in order to defray the necessary vast expenses of the expedition.

Knowing that Lord Thomas Howard was at the Azores, waiting to intercept the treasure fleet, the Spanish king purposely delayed its departure from Havanah until an unusually late season of the year. He hoped that Howard would be forced to return to England in order to re-victual. But in case this was not so, he fitted out a large fleet of fifty-three sail to convoy the treasure fleet and, if necessary, to destroy Lord Howard's squadron.

The Spanish fleet duly sailed; but with it sailed Captain Middleton in a ship sufficiently swift to keep in touch with the Spaniards. During the night of the 9th of September the Spanish fleet overran the island of Flores and before they could return on their tracks Captain Middleton brought the news to Lord Thomas Howard.

Howard immediately made preparations to weigh his squadron, hoping by his superior sailing to escape the enemy. But some delay was caused, since a large portion of his crews were on shore, sick. He eventually got all his men on board and made sail, just as the Spanish fleet appeared around the south side of the island.

Sir Richard Grenville, whose duty it was, as Vice-Admiral, to bring the up rear, according to the custom of the times, was the last to leave,

in the "Revenge." Out of a crew of about 200, 100 had been sick on shore ; and as soon as he had got these on board, they were placed down below on top of the ballast.

By this time the Spanish fleet had closed considerably, and, yet Sir Richard could have escaped, by running before the Spaniards, to the North. But this he refused to do, since to fly before a Spaniard was considered, by him, to be a shameful thing to do. His captain and officers, being seamen, tried to persuade him with their nautical advice and experience, but Sir Richard would not listen.

It must be remembered that, although Sir Richard held the rank of Vice-Admiral, he was by profession and training a soldier, and understood little of naval tactics. Also, according to contemporary opinion, he was a man who stood no opposition, and considered that all men should make way for him, be they friend or foe.

In the result, he attempted to cut between the two divisions of the enemy fleet, and so fell under the lee of the great galleon "San Fillipe," of 1,500 tons, carrying 33 guns in 3 tiers, and being the flagship of Admiral Britan Dona. The great height of the "San Fillipe," compared with the little "Revenge," caused the latter to become becalmed and the Spanish admiral immediately lay the "Revenge" alongside. Within a few minutes, three other of the enemy also lay the "Revenge" alongside, so that she had two enemy ships on each side with which to contend

The "San Fillipe," having received the guns from the lower tier of the "Revenge," loaded with cross-bar shot, shifted herself with all diligence from her side, utterly disliking her first entertainment. This vessel eventually sank. The other ships alongside attempted to board the "Revenge" again and again, but were driven off with great slaughter, being either forced back into their ships or into the sea. It must be remembered that the "Revenge" had only about 100 men fit for fighting, whilst these Spanish ships had from 200 to 800 soldiers, besides their seamen crews.

Early in the fight, one of the victuallers, the "George Noble," of London, being one of the three ships of Howard's Squadron who remained by the "Revenge," being hit by the Spaniards, fell under the lee of the "Revenge," and asked Sir Richard what he would command him. Grenville bade him save himself and leave the "Revenge" to her own future.

Another of Lord Thomas Howard's squadron, the small ship, "Foresight," Captain Vavisor, remained to succour the "Revenge." This ship hovered around for two hours after the fight began, until she was surrounded by the Spaniards, when she, with difficulty, got clear and escaped.

The fight then continued without intermission well into the night. Many of our men were slain or hurt and of the enemy the "San Fillipe"

and the "Ascension," besides two other great Armados, were sunk, and in many other Spanish ships great slaughter was made.

Sir Richard was wounded, but refused to leave the deck until an hour before midnight, when he was shot in the body by a musket, and as the wound was being dressed, was again shot "into the head," and "withall his chirugion wounded to death."

"The Spanish ships, which attempted to board the 'Revenge,' as they were wounded and beaten off, so always others came in their place, she having never less than two mighty galleons by her sides and aboard her. During the fight, which lasted from 3 p.m. till 6 a.m., no less than 15 of the enemy ships were engaged, whilst the remainder of the 53 ships comprising the Spanish fleet, looked on. But these 15 so ill approved their entertainment, as they were by the break of day, far more willing to hearken to a composition than hastily to make any more assaults or entries. But as the day increased, so our men decreased, and as the light grew more and more, by so much grew our discomforts. For none appeared in sight, but our enemies, save one small ship called the 'Pilgrim,' commanded by Jacob Whiddon (a fine Devon name) who hovered all night to see the success, but in the morning, bearing with the "Revenge," was hunted like a hare amongst many ravenous hounds, but escaped."

About 6 a.m. on the 11th of September, 1591, the "Revenge" was reduced to almost a wreck. Nearly all her powder had gone. All her pikes were bent, forty of her men were slain, and nearly all the remainder were wounded. Only 100 of her crew were fit to fight at the beginning of the action. For sixteen hours they had withstood the repeated attempts at boarding—the Spaniards' favourite method of sea fighting—and assault by fifteen large ships of the enemy, besides receiving some 800 rounds from their guns. The Spanish ships were continually being supplied with fresh men and powder, whilst the "Revenge" had no means of replenishing either her men or ammunition.

Sir Richard, finding his masts shot away, his upper works all gone, and the upper deck almost flush with the water, by reason of the leaks caused by the enemies' shots, called upon his master gunner, "sink me the ship, split her in twain." The captain and the master of the "Revenge" tried to persuade Sir Richard to surrender, but this he steadfastly refused to do; and the greater part of the ship's crew sided with their Admiral.

Whilst the dispute was in progress, the captain managed to steal on board the flagship of the Spanish general, Don Alfonso Bassan, who was in command of the enemy fleet. Here he found that the Spaniards had no stomach left for the fight, and were prepared to accept surrender under almost any conditions. The terms agreed upon were, that all the crew of the "Revenge" would be free from imprisonment and the galleys and were to be returned to England. Such as were capable of paying a ransom, to pay it according to their estate.

Sir Richard, on his captain's return, refused for a long time to comply with these terms, and again called upon his master gunner to "sink me the ship." But by now his crew were against him, and he was forced to submit. The master gunner tried to commit suicide with a sword, but was disarmed and locked in a cabin. Eventually the ship surrendered. This is the only Queen's ship that struck to the Spaniards in the war, and only one other English ship struck, a private man-of-war, Sir John Hawkin's "Dainty," wherein 75 Englishmen fought 1,300 Spaniards from the 20th to the 22nd of June, 1594.

It may well be wondered how the "Revenge" was able to continue this fight for such a length of time, and against the onslaught of such overwhelming numbers. One of the reasons is that the Spanish guns were only about half the size of those carried in the "Revenge." Moreover, the "Revenge" was very stoutly built, of thick timbers. And although the Spaniard preferred to board, considering a fight between ships with guns only as ungentlemanly, it was no easy matter to take a ship like the "Revenge" by boarding, protected as she was by stout netting and equally stout men behind the netting. At the best the enemy could only get into the waist, and if driven, the crew of the "Revenge" could take refuge in the fore and after castles closing the doors thereof and firing into the waist through prepared loopholes. But even taking these facts into consideration, it was a glorious, if unnecessary fight, for in it there were slain or drowned well nigh 2,000 of the enemy.

The Spaniards did not for long hold their prize. Sir Richard Grenville died on board the general's ship two or three days after the action. The "Revenge," with her prize crew of 200, was driven ashore in St. Michels during the violent westerly gale that sprang up after the action. Besides this loss, some twenty ships of the Spanish fleet were driven ashore and lost. And out of 123 ships of the treasure fleet, only 25 reached Spain. Thus, as in the case of the Spanish Armada, did the elements fight on the side of England.

PROMOTION BY MERIT IN THE NAVY

AN HISTORICAL REVIEW

By COMMANDER C. N. ROBINSON, R.N.

"Naval people may be considered, more than any other class, the sport of chance."—Sir T. Byam Martin, Admiral of the Fleet.

"Luckily for us, seniority is not the rule of the Navy. We are fortune's favourites."—Admiral Sir Vesey Hamilton, First Sea Lord.

"Favouritism is the secret of naval efficiency."—Lord Fisher, Admiral of the Fleet.

THE plea of Lieutenant R. D. Foster, advanced in the last issue of the JOURNAL, for the promotion by selection in the Army, will have been read with interest and some sympathy in the sister Service. From its infancy, advancement by this method has been a traditional observance in the Navy, and has proved to have its advantages, if not to be in a measure absolutely necessary. As a result of much consideration and many trials, selection is still the rule not only for advancement to the higher grades, but also for the entry and retirement of officers. Blocks in promotion, however, in the lists are by no means confined to the land Service, though many committees have consulted and made recommendations for their remedy. Promotion by seniority would not improve matters, and although retirement schemes have brought some relief, these have proved so far merely a palliative. In the old days, the toast of the midshipmen was: "A bloody war and a sickly season." The one brought opportunity for the exhibition of personal bravery and outstanding ability; both helped towards a clearance of the lists, with a consequent increase of vacancies. In peace time there must always be disappointment, for many are fit, but few are chosen. No close analogy can be drawn between the two Services in regard to the advancement of officers, for the regard for an old ship, and the glorious memories her name may recall, do not create the *esprit de corps* of the regimental system, upon which the effect of selection might be disturbing. A glance, however, at the history of naval administration in this respect from very early times presents many points of interest, and may, indeed, be held to have some lessons worthy of general consideration.

Any retrospect of the methods by which promotion has been obtained in the Navy cannot leave untouched those also concerning entry to the Service, and the schemes of retirement which in later times were intended to give some compensation to those passed over in the competition for

advancement. Until the last quarter of a century, nomination—which was in itself a means of selection—had always been the starting point of entry. Even now, although a nomination is no longer required, a committee of selection sits to weed out alleged unsuitable candidates. The idea of nomination is a survival from a feudal age, and the incidence of its working in the Navy has often been the cause of error to historians. In Tudor times, young noblemen were sent to serve an apprenticeship as pages or squires under those of higher rank than themselves, and in this way to gain the experience which would fit them to become occupants of the superior grades in the profession of arms. In those cases where their patrons undertook duty afloat, these youths also went to sea and while acquiring the rudiments of their calling, served at their seniors' tables as cabin boys. Thus were they nominated for the King's service, and looked forward to promotion to the rank of lieutenant, an office introduced in 1580 with the intention of providing the captain of a ship with an executive assistant qualified to take his place on occasion. These lieutenants, therefore, were of good social position, and generally chosen from amongst the relatives or personal friends of the captain or admiral. A similar practice obtained in the Merchant Service, where the sons of shipowners or shipmasters, accompanied their fathers or friends to sea. As every ship carried an armament in those days, and every officer was trained to fight, if necessary, those who exhibited exceptional qualities in trading vessels were selected for the Royal Service, especially when their ships were also drawn upon to supplement the war fleet. Thus we had serving at the same time noblemen like Lord Howard of Effingham, Lord Harry Seymour, and Lord Sheffield, alongside merchant adventurers like Drake, Fenner and Frobisher. Gradually a change took place in favour of the men who had been brought up as youngsters to a seaman's life, but there was much jealousy between the so-called tarpaulins and the gentlemen captains, whose claims to preferment rested mainly on social eminence or family ties.

In course of time, the title of midshipman was given to the young gentlemen chosen to go to sea with the idea of qualifying for commissions. Charles II., in 1676, introduced the plan of "King's letter-boys," or "volunteers by order," with the desire "of giving encouragement to the families of better quality among our subjects to breed up their younger sons to the art and practice of navigation in order to the fitting them for further employment in our service." In 1677, too, he established rules for the qualification of lieutenants, among the conditions being the passing of an examination after three years' service at sea, "including one as midshipman." Throughout the 17th and 18th centuries, there were other designations under which youngsters went to sea with the help of a relation, friend or neighbour. They might be rated on the ships' books as an officer's servant, a captain's coxswain, an A.B., a landsman, a boy, or later as volunteers of the first class, and, after 1843, as naval cadets, one of the first to hold the last-named rating being Sir Clements Markham. But whatever the designation, all served their apprentice-

ship in the same way, and were intended for officers. Many passed for lieutenant, and then, whether they obtained a commission and rose any higher, depended sometimes on merit, but a great deal on the influence of wealth, court or party, family or social interest, and certainly professional support. The system of entry by nomination, instead of as the servants or followers of a particular officer, belongs to the second half of the nineteenth century. The right of nomination rested in the hands of the Admiralty Lords, with a few exceptions arising out of the appointments of flag officers and captains. But all through, it will be noted, the principle of selection obtained. Not until the common entry system was announced on Christmas Day, 1902, was the plan of nomination done away with.

FAMILY INFLUENCE AND PROFESSIONAL ABILITY.

To illustrate the development of the process of selection for entry and advancement, examples may be given of some of the leading naval commanders in our history. Charles Howard, of Effingham, made early acquaintance with seafaring matters under his father, but he became Lord Admiral, not on account of his naval knowledge, or aptness for command, but because he was a Howard, the son of a Lord Admiral, and cousin to the Queen. Drake, on the other hand, served a long apprenticeship to the sea, until his reputation attracted attention at Court, which led to his employment on enterprises which made his fame permanent. In the next century, Blake's appointment was political, although, like Howard, he had some knowledge of sea affairs. It was different again with Rooke, who began as a volunteer in the Navy in the second Dutch War, became a lieutenant of the "London" at Solebay, and of the "Royal Prince" at Schooneveld, and took command of the latter when she was disabled. Sir Cloudesley Shovell's career is an instance of one who began with the status of officer's servant, in which connection Macaulay's reference to him as a cabin-boy has given rise to misconception. Another admiral whose service record ably seconded his family interest was Anson. He entered as a volunteer at fifteen, became a lieutenant at 19, was fortunate in getting into Sir George Byng's flagship, the "Barfleur," at 22, and at 25 was promoted commander in command of the "Weasel" sloop; while 2 years later he was made a post captain just before he was 27. His rapid advancement has been attributed to his relationship to Lord Macclesfield, but it cannot have been so entirely, for he obviously had zeal and ability.

It was Anson who was mainly responsible for introducing retired pay in the Royal Navy in 1747. Admirals had formerly been promoted by selection from the list of captains, and while those passed over were regarded as having been shelved, they remained on the list and drew half pay. From 1747, they were promoted to rear-admirals on a retired list, and not being commissioned as of the blue, white or red squadrons, were jokingly referred to as rear-admirals of the yellow squadrons, or "yellow admirals." The idea, of course, was by the superannuation of older or

infirm officers to facilitate the promotion of their juniors, but no provision for the Service as a whole was made. The problem confronted Howe a few years later. Good family connections helped him to start on his successful career, and he went into the Navy from Eton at 13, became lieutenant at 18, and within eighteen months was appointed in command of a sloop, the "Baltimore." A gallant action he fought in this vessel, when he received a severe head wound, won for him promotion to captain at the early age of twenty. As First Lord, forty years later, he had to reduce establishments, and his scheme for promotion to the flag list, whereby sixteen captains went up and forty were passed over, was naturally unpopular in many quarters. "The system of pure selection," said Professor Laughton, "is comprehensible, so is that of seniority. But the plan of promoting large batches of selected men, and relegating those who were passed over to what was then called the yellow list, was a clumsy and aggravating expedient."

SELECTION JUDGED BY RESULTS.

One of the last of our distinguished admirals to enter by the method of "King's letter boy," already mentioned, was Rodney. His mother's sister had married Lord Aubrey Beauclerk, a captain in the Navy, by whose interest, no doubt, the boy went afloat, at the age of 13. His career also illustrates the value of professional interest. He was made a lieutenant at 20 by Rear-Admiral Haddock, and a captain at 23 by Admiral Mathews, in whose flagship, the "Namur," he was serving, but apparently his confirmation in the latter rank depended partly on his successful return to England in charge of a convoy of 300 sail. An explanation of the term, "King's letter boy," and a review of the system of entry and advancement in the Navy, will be found in Mr. David Hannay's monograph on Rodney in the *English Men of Action* series (1891). His summing up is that, while a captain might pay his tailor's bill by putting his tailor's son on the quarter-deck, he was much more likely to put there his own son or nephew, or the son of an old comrade. In any case, his own honour was concerned in the fitness of the lad whom he thus marked out as candidate for a lieutenant's commission. Says Mr. Hannay: "The system, or no system, which allowed the rapid rise of Anson and Hawke, Rodney, the Hoods, Howe, Collingwood and Nelson, can dare to be judged by its fruits. Could the most uniform organisation, the most careful avoidance of favouritism and jobbery, have done better for us?"

The end of the wars with Napoleon aggravated the condition of large numbers of deserving officers in respect of promotion, and changes came about in consequence. The principle of selection still obtained, but modifications in practice were made, particularly in regard to reducing the extent to which influence might be exerted from political or family sources. St. Vincent, at the peace in 1802, had already made some progress in this direction. He refused many applications for promotion by young captains, or others newly appointed, in favour of those who had been longest on the half-pay list. The difficulty of getting back into

Service from half-pay is well shown in the memoirs of Admiral Sir J. Brenton, who wrote that it was only those in the stream who were carried along with it, whereas others were left, particularly the first lieutenants of line-of-battle ships promoted after general actions. They had received the rank of commander with the delight so natural to the attainment of such a step; but, wanting interest to obtain a command, were soon forgotten, and many had to regret that they had gained their promotion. St. Vincent well knew the evil of a monopoly of the aristocracy in this respect. About 1807, in a conversation upon naval affairs with George III., he said: "I have always thought that a sprinkling of nobility was very desirable in the Navy, as it gave some sort of consequence to the Service; but at present the Navy is so overrun by the younger branches of nobility and the sons of Members of Parliament, and they so swallow up all the patronage and so choke the channels to promotion, that the son of an old officer, however meritorious both their services may have been, has little or no chance of getting on."

It became evident that the Service must be free to manage its own affairs in this matter; that reform, as in other matters, must come from within. St. Vincent held that the best judges of an officer's worth were those who had served with or over him. Individual preference in the selection of officers, however it might seem to outsiders, was peculiarly desirable in the conditions of the Navy, and it was right that preference based on personal appreciation of professional capacity should rule, and the power of selection be exercised—to adopt Collingwood's phrase—"with knowledge of the character and ability of the officers." Lord Fisher, in a later age, well knew the needs of the Navy when he declared that "favouritism is the secret of efficiency." Everything turns on how the favourites are chosen.

Stagnation in promotion was intensified after the peace of 1815, and a Royal Commission to consider the whole question became necessary. The problem was—and is—largely to find a means of clearing the lists, and so creating a flow of advancement, without causing an injustice to those retrenched. In 1818, the captains' list reached a total of 883, the highest in the history of the Navy; the commanders' list was likewise congested, and so were the junior grades. As late as 1841, there were 683 captains on the list, headed by 20 who had 35 years' seniority, having been promoted in the year after Trafalgar, and 759 commanders, headed by one promoted 47 years earlier, in 1794. These figures give a small idea of the situation which might have arisen after the recent war had there been no Royal Naval Reserve and Royal Naval Volunteer Reserve to allow for expansion, and had there also been no adequate scheme of retirement for age and non-service. Some of our most distinguished admirals, in days when wars were more frequent, waited long periods before getting their flags. Keppel was 16 years a captain, Nelson 18 years, Howe 24 years, Duncan 26 years, and even St. Vincent had to remain 27 years on the captains' list before he became a rear-admiral, at the age of 53.

It will thus be seen that even when the luck of a death or haul-down vacancy, or of an influential friend in high places, got an officer on to the commanders' or captains' list at an early age, his progress beyond this was often retarded. For an example of a very successful career, the case of Sir Geoffrey Hornby may be cited. He obtained his commission as lieutenant in 1844, aged 19, by a death vacancy in the frigate "Cleopatra," intended for the son of Admiral Percy, who, however, was not of an age to take it. In 1850, Hornby was again promoted by a death vacancy, and was appointed commander of the "Asia," his father's flagship, at the age of 25. The father later had a seat on the Board of Admiralty of the Duke of Northumberland, and when that nobleman resigned, in November, 1852, on the defeat of the Government, he promoted to captain the sons of his naval colleagues, Admirals Hyde Parker and Hornby. The sequel was that Captain Hornby spent nearly five years on half pay, and all through the War with Russia had to look with envious eyes on friends fitting out ships for active service. He obtained his flag in 1869, aged 47, and when in his seventeenth year as captain.

PATRONAGE OF ADMIRALS AFLOAT.

The latitude allowed to a commander-in-chief in the old days was considerable. Promotion to lieutenant was largely in his hands. Any midshipman with the requisite service at sea could be selected to be examined by three captains and given a vacancy. The admiral could also promote to higher ranks in certain cases. Lord Barham, writing to Collingwood after Trafalgar, calls his attention to the rule by which death and court-martial vacancies were to be filled up by commanding officers, but all others by the Admiralty. An instance of the working of this, half a century later, occurred in the career of Captain James E. Hunter, who is now, at the age of 91, among the oldest surviving naval officers. When first lieutenant of the "Euryalus," in Japan, in 1863, the commander was invalided with dysentery. The admiral promoted Hunter to fill the vacancy, although the latter demurred, feeling sure he would be promoted on his return home. But the admiral insisted; and the sequel was that the Admiralty sent out Commander Wilmot to the flagship, "as it was only an invaliding vacancy," and Hunter reverted to duty as first and gunnery lieutenant. Later the captain and commander were both killed at Kagoshima, and Hunter obtained advancement in place of the latter. Death vacancies, besides being subject to chance, and to the whim of the admiral at the time, were unfair to the Navy as a whole, since one station, especially if unhealthy, might have several openings and another few or none, making for inequality of opportunity as compared with a system worked, as now, from the Admiralty only.

Haul-down vacancies served a good purpose at times in bringing officers of promise into positions of responsibility at an age when they had plenty of time to gain experience, but more often than not the custom was a bad one, since it was frequently a relative, or someone chosen

entirely irrespective of merit, who obtained the benefit. The incentive under this custom was to please and placate individuals rather than to study first the efficiency of the Service and to strive honestly to advance it. If Lord Fisher, as he himself said, lost his promotion on one occasion because he declared that masts and sails were doomed, how much more necessary was it for an officer without his energy and ability to keep on the right side of the powers that be, and take the line of least resistance? It was natural in the circumstances that the practice of "followers" should have persisted in the Navy. This word used to convey a very strong professional meaning. Defining it, in 1858, Captain Sinclair, R.N., wrote: "A 'follower' was a person following an admiral from ship to ship, sharing his prosperity or adversity, treading in his footsteps, upholding his name and system above all others, standing by each other at all times and seasons, through good report and bad report, and in many instances ending happily for both parties. An admiral was sometimes enabled to give his future son-in-law a freight, his hauling-down vacancy, and his daughter." It was well into the second half of the 19th century before the custom of allowing admirals the privilege, on hauling down their flags, of nominating one lieutenant for promotion to commander was done away with.

After the war with Russia, in 1854-5, administrative changes affecting our subject followed fast and far. The long peace, and the war of 1914-18, have produced almost a revolution in methods. The establishment of the gunnery and torpedo schools, the colleges, the training ships and similar institutions were accompanied by educational tests, all of which naturally and automatically had their effect upon the promotion of officers. Selection is still the rule, and is carried out with thoughtful discrimination and an earnest desire to be just to the candidates as well as to do the best for the Service. It is a truism to say that advancement by merit is the keystone of naval efficiency, but the real difficulty is to decide who should be advanced when all candidates are equally deserving. The introduction of the "zone" system since the War, has limited the area of selection from the two grades in which this method obtains. Lieutenant-commanders are promoted by seniority from the lieutenants' list, but they are selected for advancement to commander. The Orders in Council fixing the maximum number of officers in each category were temporarily modified during hostilities (Order in Council, September 30th, 1914), and in certain grades, in spite of retrenchment schemes, the numbers are still apparently over establishment. Thus it has come about that while the limits of the zones have been gradually curtailed, the numbers within them remain very high. Another restriction of the zones is to be made in June, 1926, commanders from five to seven and a half years being taken for promotion to captain; and lieutenant-commanders from two and a half to six years being taken for promotion to commander. In the selection on 30th December, 1925, the number of new captains promoted was ten. The number of commanders in the zone from which these officers were

taken was 143, of whom 40 were in the zone for the last time on an occasion of half-yearly promotions. The number of new commanders promoted was twenty. Lieutenant-commanders in the zone from which the twenty were taken numbered 225, of whom 39 were in the zone for the last time. In proportion, therefore, only one commander out of fourteen in the zone goes up to captain each time; and only one lieutenant-commander out of eleven is promoted to commander.

It is almost indispensable that individual preference, from intimate and personal knowledge, should become a factor in the process of choosing the officers for promotion in the face of such severe competition. It has been said that it is well to have been recommended for zeal and ability by a commander-in-chief, but better still to have performed some notable service under the eye of an Admiralty Lord, since the final selection is made by the Board.

SELECTION FOR THE FLAG LIST.

From captain to rear-admiral, promotion is by seniority, but three regulations modify the working of the rule in practice. One is that captains whom it is decided not to employ further after promotion to flag rank are retired, at Admiralty discretion, on promotion to the rank of rear-admiral. Another is that all appointments are filled irrespective of seniority, and sometimes irrespective of rank—a vice-admiral being chosen for a command usually assigned to an admiral, or a rear-admiral to succeed to one held by a vice-admiral. The third regulation is that for non-service, the periods during which an officer was allowed to remain on half-pay being shortened in 1914. The effect of these three rules is to make advancement to flag appointments by selection. No one will deny that there must always be selection for the command of fleets and the higher posts of special responsibility. If properly applied, selection makes for younger captains' and flag lists. It affords opportunity for rewarding men whose outstanding service demands special recognition. But it may not be always to an officer's interest; qualities displayed by a young officer in action, which won for him a decoration, are not necessarily those most to be desired in the commander of a fleet, and not every battleship captain of more than respectable capacity would make a good Commander-in-Chief or Admiralty Lord, as St. Vincent pointed out. War generally serves to quicken up promotion for a few, and in this respect the late struggle produced instances which parallel anything which occurred in the 18th century. Cadets enrolled by special entry from the public schools became midshipmen within four months, sub-lieutenants within twenty-one months, and lieutenants well within three years. Perhaps one of the greatest benefits of selection is that it stimulates young officers to emulation and the zealous performance of their duty. In this way, it may be said to promote efficiency.

Something must be added, in conclusion, about promotion from the lower deck, or, as the old phrase had it, "through the hawse holes." Historians have often drawn erroneous deductions from the circumstance that officers of rank and distinction entered in humble, even menial,

ratings, but there was no more significance in this than in the fact that Prince William Henry, afterwards William IV., was entered and served in the "Prince George" as an A.B., from 14th June, 1779, or that Nelson and other great sea commanders once filled the role of captains' servants. As explained earlier in the article, this was but the ordinary and recognised channel by which a young gentleman entered the Service and acquired experience for the commissioned ranks. A large class of so-called lower deck officers were those who had received their early training in the Merchant Service, and had been transferred to the Royal Navy to supply the needs of war. Several midshipmen and masters' mates from that Service became lieutenants, and a few commanders and captains. Benbow, after an apprenticeship in the Merchant Service, was serving as master's mate in the Mediterranean when he came, at the age of twenty-five, under the notice of Admiral Herbert, who made him a master, and later, at the revolution of 1688, obtained for him command of a ship. Another instance of a similar kind was that of Captain Cook, the circumnavigator. It by no means argued a humble origin that such officers first went to sea and learnt their profession in private service. Their position on transfer to the Royal Navy was analogous to that of the Supplementary Lieutenants, R.N., taken into the Service in modern times to fill vacancies, or to the officers of the Royal Naval Reserve when mobilised for active duty in the war.

ADVANCEMENT FROM THE LOWER DECK.

Yet there were undoubtedly some cases in which bona fide selection from the lower deck was made in times of need, not always with success. Admiral Sir Thomas Pasley, writing to St. Vincent on 8th February, 1802, referred to "many improper persons, such as writers, under-clerks and secretaries, nay, even menial servants, who had obtained two years' rate of midshipman, having during the late war been placed on the list of lieutenants, to the great injury and disgrace of His Majesty's Service." In contrast to this sweeping condemnation are the instances in which lower deck ratings made good on the quarter deck, not as the result of any recognised system, but in spite of the prevailing conditions. A typical instance of the kind is that of John Smith, who was taken under the influence of the Marine Society on 8th July, 1797, as an orphan. Trained in their ship, the "Beatty," off Deptford, the predecessor of the "Warspite" of to-day, he was drafted to sea as a warrant officer's servant. Some years later he sought the Society's influence to get him made master's mate, and in 1805 he became a lieutenant, helped by Admiral Sir John Colpoys, a Vice-President of the Society, who happened to be on the Admiralty Board. By continued good service, he became a commander in 1812 and a captain in 1822, at the age of forty-one. His case was not only extremely rare, but almost entirely turned upon the influential backing which he was able to secure for his own meritorious service claims. There was nothing very exceptional in his becoming a master's mate, and hundreds of officers of this rank passed for lieutenant at the Navy Office, but were never commissioned to a ship. It is doubtful,

too, if with all his advantages he would have risen had not a great war been in progress.

An Order in Council of 1853 made possible the advancement of warrant officers to commissioned rank for service in action, but it was not until thirty-four years later that the first actual advancements under this "gallantry clause," as it was known, were made, when Chief Boat-swain J. Webber and Gunner R. A. Cathie became lieutenants. These and others were men of middle age, but more fortunate was Gunner T. J. S. Lyne (now Captain T. J. S. Lyne, C.B., D.S.O., retired), who for gallantry in South Africa was promoted to lieutenant at King Edward's coronation, after four years as a warrant officer, and before he was thirty-two. Further zealous service carried this officer to commander in 1912, aged forty-two, and to captain in 1918, aged forty-eight, and in 1924 he flew a broad pennant as commodore at the Naval Review. He retired in August, 1925, under the age limit of fifty-five.

Commissioned rank on retirement, or for short periods just before retirement, was extended to many warrant officers from 1903 onwards, but the first attempt to produce a real lower deck promotion scheme, one that would bring officers into the wardroom for sea service at an age when they might still have a career before them, was that of Mr. Churchill in March, 1912, known as the mate system. It was then decided to select 25 or 30 young warrant or petty officers each year, and after examination, to commission them as mates (sub-lieutenants), from which they might rise to lieutenant after satisfactory service afloat. Since the war, the number selected annually has dropped to about six. It was expected, and has so far proved to be the case, that the great bulk of them would retire with a career which had carried them from bluejacket to lieutenant-commander or commander, but sufficient time has not yet elapsed to determine whether any, or what proportion, are able to reach the higher ranks. The two senior in the original group of mates are now lieutenant-commanders of 14th February, 1923, and are, therefore, just entering the zone for selection for promotion to commander. Since the War, concessions have been made in respect of age and qualifying service, and a man need not be a warrant or petty officer to be eligible, nor need he complete seven years in the Navy; the rank of mate can be reached by any seaman of the age of twenty-one, and has been attained direct from A.B., while the earlier age at which commissioned status is granted places the aspirant on a level with those who enter as special entry cadets from the public schools.

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PROMOTION BY REJECTION IN THE ARMY¹

By LIEUT.-COLONEL BAIRD SMITH, D.S.O. (Retd.).

EVERYONE is familiar with the story of the subaltern found pencil-marking the regimental page in the Army List with notes of those of his seniors likely to retire, or "likely to die"; he was, for his day, a rare bird—a junior anxious about his future prospects. But among his modern successors are apparently many who are conscious of a similar uncertainty.

They have some excuse for disquietude; not only on their promotion account, but about their actual livelihood. The not yet forgotten surprises of the "axe"; new ones foreshadowed by the fluctuations of political ideas about "armaments"; the rumours of new conferences to consider further scrapping of *matériel*, and disbandment of more men; these things must give pause to all but the most thoughtless and happy-go-lucky.

Compared with such possible threats to their chosen career, a mere block in promotion must appear a minor ill, and where all are affected, to be cheerfully borne. But if to these uncertainties were to be added another, in the form of a new system of promotion by "merit," the outlook of the majority would indeed be darkened, and the result might well be to dam the source from which the supply of officer-candidates flows.

No doubt many junior officers hold strong views about the top of the "block," and could write a good prize essay on a method of pushing their seniors up or out, that would need for its working neither a bloody war nor a sickly season. Officers of more mature age will hold other views; and the higher up the tree they get, the dimmer will appear that ideal, which aims at sorting out and labelling the members of the corps of officers as though they were so many eggs for market. And as even the freshness of the "fresh" can never be really tested till the shell is broken, so "selection" by any peace-time process is apt to provide a very delusive trade-mark.

PROMOTION BY MERIT.

It will easily be agreed that military "merit" is very unlike that which, for example, is literary, artistic, musical, legal, clerical or political; in that the possessors of these other kinds are known by their works, which are works of peace. A form of "merit" which is compounded of moral, intellectual and physical qualities, obviously lends itself unready to analysis; certain tests cannot ordinarily be applied, but,

¹ An article on "Promotion by Merit in the Army" appeared in the JOURNAL of November, 1925. See also "Correspondence" p. 163.

only as opportunity, which cannot be foreseen, may arise. Moreover an agreed definition of such merit is not very easily arrived at. It need hardly be said that an aptitude for catching the eye of authority, the officious display of zeal, or marked thirst for information, are none of them special marks of the meritorious; yet they have been so mistaken before now. Nor will it suffice to sum up the whole matter in the expression "character"; this is only exchanging terms, without defining them. There are, however, certain qualities, which in more or less marked degree are essential attributes of the good officer. These are:—

- (a) Moral and physical courage.
- (b) Hardihood.
- (c) Loyalty.
- (d) Sense of personal duty.
- (e) Sympathy.

These qualities do not necessarily bring their possessor any peacetime distinction; and in fact are quite apart from those other qualities expressed in the phrase "best brains." The difficulty of even approximately assessing such "merit" is consequently very great. A certain majority of officers from time to time obtain qualifications rendering them "fit" for promotion; but those who are to be "accelerated" must needs be "fitter." As all undergo the same examinations, and as further examinations for the "selected" are out of the question, the only selective process left will often take the form of guesswork, hearsay or arbitrary choice.

Besides these examinations, there are the equally important reports which follow the officer through his career till he reaches a position on the safe side of the last obstacle. During the early probationary period he is naturally in a position far from secure; but his subsequent life would be insupportable, if probation in such a sense were never to cease. Of all these reports, the Annual Confidential Report is the most important, since it introduces a periodical crisis for the regimental officer. Though it is drawn up by his immediate superiors, who at least know him and can perhaps form an average opinion, yet sooner or later it comes to be read and estimated by someone who has never seen or heard of its subject; and the higher authority into whose hands it passes, the vaguer becomes the estimate, the more devastating an unfavourable verdict. When, however, this document has once received the favourable endorsement of the highest authority, it acquires a value as positive as a medical certificate, or a B.A. degree; though its sole source may be the mistaken or prejudiced judgment of one man.

The assessment of an officer's war services is a much more concrete affair. It can be judged under the two matters of experience gained, and distinctions won. As to the first, it must always count in an officer's favour that he has been "on service" of some sort; and though distinctions are not an infallible guide, they afford presumption that the

recipient has acquired some "merit." The question of promotion in war-time need not cause the trouble that it does in peace; war will provide "acceleration" enough; in fact, the main difficulty may be to find sufficient and suitable candidates for commissions. "Best brains," 100 per cent of "merit" in examinations and confidential reports, may not count as a feather in the balance, in which the officer is weighed in the day of battle. That balance will show his real worth; and if he survive, there should be no need to employ other, perhaps false scales, to "ameliorate" his position, or that of others at his expense.

ADVANTAGES CLAIMED FOR THE "MERIT" SYSTEM.

It seems hardly justifiable to speak of the "weeding out" process proposed as "automatic"; but even if it could become so, this would only mean that the regimental cadres were overfilled, so as to provide for a periodical discard. One of the objects claimed for the system is the attraction of the "right type" of candidates; but the obtaining of such candidates depends on many other things than the promotion rules, about which few boys at school or college bother their heads. If, indeed, there are some so conscious of their merit that the Army seems a profession hardly suited to their talents, they had much better go elsewhere. What does attract to the Army is the prospect of a roving military life, with its spice of adventure and danger, its comradeship and prestige; no normal aspirant regards it mainly as a ladder for his ambition. As to the stimulating effect of "selection" on those already serving, which it has been suggested would take the form of increased professional zeal and study, this would tend rather to defeat the process of choice, by raising the average of "merit" all round. But far from being stimulating, the effect is likely to be the reverse. It cannot be overlooked that promotion is, for regimental officers, from regimental lists. The officers of a regiment thoroughly understand the circumstances of seniority promotion, and object solely to its slowness. As the selections for "merit" would be comparatively few, and these promotions still in the same list, the result would not be to lessen any block, but merely to alter its effects; and whereas at present, if there is discontent, it is impersonal, the proposed process would introduce a spirit of envy, perhaps a feeling of injustice, into an otherwise contented association of comrades. Of course, the "selected" might be promoted into other units; but it is unnecessary to examine here the many complications of mixed promotion, from regimental and general lists simultaneously. Inside the regiments some of the "selected," gifted with sympathy and tact, would doubtless be able to smooth over the situation; but others would rather exasperate it. The early retirement of those superseded would of course ease the tension; but this would mean that the "meritorious" trampled, as it were, over the bodies of their fallen comrades; a proceeding that, sooner or later, would result in the total disappearance of the regular officer.

It seems to be rather unwarrantably assumed that chiefly the "meritorious" officers chafe at the blocks in promotion, and that they only need to be considered; but in any system of "selection" the non-selected have also to be provided for, and cannot be allowed to deteriorate into a "depressed" class. In practice a situation would be likely to arise, somewhat similar to the old purchase days; when money and influence played the part now designed for "merit." A discontented majority, consisting of all those who were considered only good enough for seniority promotion, intensified in slowness by the new arrangements, would hardly form an ideal repository for that "esprit de corps," or that loyal comradeship on which the welfare of a regiment depends. The average ability of officers is high, and comparatively few fail to obtain a certificate of fitness for promotion. Officers thus certified can hardly be regarded as doubtful cases, liable to be deprived of their seniority on regimental lists, to serve the interests of the supposed more brilliant among their comrades. There are, of course, certain extra qualifications or military aptitudes, acquired by some officers as the result of hard work and professional keenness, which cannot be disregarded. A staff college certificate, however, brings its own reward; and the staff career, with its good pay, and prospects of eventual promotion above the regimental lists, needs no further inducements. Other qualifications, such as interpreterships, carry, or should carry extra allowances. Even if all officers had equal opportunities for acquiring such extras, these would still lie outside the supreme test of "merit," that aims at placing certain officers far above their contemporaries, and entrusting them while still young with the responsibilities of their seniors.

THE DIFFICULTIES OF THE SCHEME.

First comes the task of discovering "merit," after every authority concerned has agreed what this word is to mean. There is something intangible about "character" which makes its assessment in terms of percentage almost impossible. Courage, of the early morning kind, may lie hid under the mildest demeanour; and sudden responsibility may paralyse the most self-confident. Physical fitness is often accepted with a mere medical certificate, though bodily endurance under stress is as much a matter of will as of stamina. The sympathy that is the essence of comradeship and the magic of leadership can only be appreciated by the officer's own associates and subordinates. On the other hand, there is little difficulty in discovering those whose light is not hidden under a bushel, or in accepting them at their own valuation. The advocates of classification by "merit" seem to imagine that to recognise the difficulties is to overcome them; or at least that their solution can be left to some future time, subsequent to the introduction of their scheme. In the meanwhile the obstacles would not be surmounted, only ignored.

The degrees of "merit" being assumed as ascertained, what follows? A more or less arbitrary sub-division into categories—so many of each rank for accelerated promotion, so many for ordinary or deferred. The

effect of "accelerating" certain officers would be still further to retard the others, whose future prospects would thus become permanently clouded. "Acceleration" would, of course, bring a quicker increase in pay, and a longer wait for such rise on the part of the "retarded." Far more officers will in the end suffer by the scheme than benefit; so that it is hard to understand how the general advantage to the Service can be very considerable.

Compared with the difficulties of expressing an officer's qualifications for "selection" in exact terms, the question of "favouritism" is of secondary importance. Some are born lucky, some have advancement thrust upon them; in the best ordered system in the world interest will always find some place. This is not to be eliminated by giving individuals "numbers" as a kind of disguise. For in the case of field officers, at least, no one could be justly recommended by his divisional or corps commander for "accelerated" promotion, unless he were personally known to these superiors, who could exercise no intelligent choice among a series of anonymous candidates. In such a serious step as the "selection" of any officer, no sort of perfunctory approval from high-placed superiors, who might not even know him by sight, could be considered sufficient; personal acquaintance between the aspirant and his judges would be essential. This might involve a necessary degree of intimacy between subordinates and superiors, rather hard to bring about; yet this would be only a minor difficulty of "selection."

Promotion from a general list, and the "regimental spirit" are usually considered incompatible. Yet the adoption of such a list, or lists, for all regimental officers is the first step in any system of "pure selection." The "selected" can then be given steps on the seniority list that will at least affect all of their rank, and not alone their own regimental comrades. They can be promoted to any vacancies that may occur; it being a necessary condition of "acceleration" that the fortunate few must be ready to take their step in any unit of their own arm. The feeling of injustice aroused by these translations will, at any rate, be mitigated in the aspirant's corps by his departure elsewhere; while his new unit can try to accept him at his estimated value. But it would be wrong to suppose that such a constant shuffling would have no bad effects. The promotion of the talented, thus helped up from rung to rung of the military ladder would certainly be "ameliorated," but at the expense of much that gives a value to the "regimental spirit." To preserve and augment this spirit, in the interests of the majority of officers, of their men, and of the army at large, is surely more important than to manufacture rapid careers for the impatient minority.

THE PRESENT SYSTEM.

The present system may be defined in a phrase of "the Haldane Report," as promotion "by seniority tempered by the rejection of the unfit." It does not set out to be a means of avoiding "blocks," as do other proposed schemes. For a serious block in promotion has no con-

nection with the "merit," or lack of it, of the officers concerned. It is brought about by the disbandment of units, excess of entry of candidates, or insufficient retirements at the top of the list; and then can only be dealt with by some such rough instrument as the "axe." Since the abolition of purchase the rejection of the unfit has been a recognised feature of Army promotion, and in its modern extended form may be said to begin in the Public Schools, continue at the Universities and the Military Colleges, and persist throughout the different grades up to field rank. The series of examinations and reports, that a candidate must survive before he obtains a commission, have a certain negative value; but evidently the Haldane report did not assess this very high. There follow the various promotion examinations, finishing with the course at the Senior Officers' School; and any gaps left in this testing process are supposed to be filled by the Annual Confidential Report.

It may be argued that this machinery of "rejection" is old-fashioned and clumsy, and gives only moderate results; that too many "unfit" manage to escape its action altogether. But to devise means of improvement, to bring the machinery up to date, is surely a more hopeful task than adopting a process even slightly resembling psycho-analysis. To select those unfit for promotion should be a positive choice, not at all like that of victims for the "axe." The theory of its working should be that the standard of "fitness" is sufficiently high to satisfy all reasonable military requirements, and that the majority of officers can attain it; not that most are of inferior brains, fit only for routine work, or that only here and there can superior individuals be found.

As has already been suggested, serious "blocks" in the system can be avoided by careful regulation of the supply and wastage of officers; so that candidates are not recruited in excess, nor senior officers retained too long in active employment. When, for reasons beyond the control of the military authorities, a sudden superfluity is found to exist, the right procedure would seem to be, not to look round for a number of "duds," or youngsters with no claim to pension, but to lower the retirement age, without lowering the pension scales, of the senior ranks, while at the same time restricting entries to the Military Colleges till the balance is restored.

Promotion by "rejection" has its peculiar difficulties; but it avoids the fatal defect of the "selection" system, the creation of a large "depressed" class of serving officers. The "rejected" depart, having failed to reach standards which, at any rate, apply to everyone. The system may not be of much use in discovering genius; after all, this may emerge at a Staff College, or become unmistakable on service; but at any rate, it should ensure that an incompetent officer never attains responsible command of a squadron or company, still less of a unit. The question of the standards of efficiency will from time to time need considering; and it is in trying to attain these standards, that the spirit of emulation and friendly rivalry between brother officers will find its natural and best expression.

SOME SMALL ARMS QUESTIONS OF TO-DAY AND TO-MORROW

By CAPTAIN H. C. BOYS, M.B.E.

NOTHING short of a bulky volume could suffice to record the development in the various types of small arm and small arm ammunition during the last fifteen years.

In consequence, this article does not attempt to go into much detail, but aims at a resumé of the more prominent and important branches of the subject in concise and non-dogmatical fashion in the hope of providing a number of pros. and cons. as a box of "Meccano," the contents of which may encourage the interested reader to construct his own conception of the ideal.

Many of the questions are highly controversial and of a nature that the writer does not touch upon with a view to providing solutions so much as inviting such consideration as may contribute to their solution.

War experience takes time to crystallize out and it is still unwise to accept its lessons too literally, and nothing demands a more temperate form of imagination than the application of such experience to the problems of the future, and this is particularly true at the present time and probably far more so than ever before in our history.

In reviewing the question one is inclined to the belief that the changes that have taken place in machine guns, as regards type, numbers and employment, is greater and more interesting than those in any branch of small arms, and the machine gun—a weapon sadly neglected before the War—appears likely to play an increasingly important part in future conflicts both in the air and on the ground.

Although there will certainly be development in many directions, it appears probable that future progress will lie mainly in the direction of what may be described as the air-cooled, light automatic; the type that entered the British service during the War in the form of the Lewis and Hotchkiss guns.

The "heavy" machine gun, the Vickers', tends to become a "law unto itself," while the light automatic tends to become, if anything, a more integral part of infantry formations than ever.

The essentials of the "light" gun are strength, reliability, handiness and relative invisibility, whereas the trend in the direction of employment at longer ranges in the case of the "heavy" category reduces the necessity for extreme handiness, and the need for more rigid mountings and the necessity for more refined appanages, such as clinometers and dial sights—if indirect methods of fire are to be

conducted on modern lines—is bound, in some degree, to reduce the mobility of the equipment as a whole. At a later stage in this article the question of the automatic, or more strictly “self-loading” shoulder rifle is discussed, and the effect of the introduction of such a weapon on the various types of machine gun as we know them to-day provides some interesting food for thought.

There is one important side issue of the main question, which is the question of keeping down the weight of what—for want of a better name—we can style the “charging” apparatus of all types of gun and particularly the lighter natures. If prolonged fire at a high rate is considered from almost any point of view the virtues of the principle of light and expendable charging apparatus—belts, strips, chargers or what-not—are apparent.

The types of gun discussed play an important part in the armament of various types of tank and armoured cars, and such employment produces another and generally additional set of requirements, such as relative invulnerability of outboard portions, special types of cartridge feed and limitations of inboard space on which efficient operation so much depends.

Unlike the ship, the tank has no definite “period” and, in consequence is of all types of gun platform the most completely disconcerting.

Certain vehicles can employ certain guns with all round bearing, while others—in the interests of lightness and economical efficiency—require guns capable of being rapidly shifted from one bearing to others. There may even be occasions when such weapons will be removed from vehicles in order to operate from positions on the ground.

Without being too sweeping, it may be said that guns of the normal Lewis type are not well suited to the needs of tanks, armoured cars or cavalry, partly owing to bulk and partly to relative fragility. The Hotchkiss while a good deal less objectionable in such respects has a somewhat inconvenient and undependable type of feed, and—while structurally sturdy—is heavy in its moving parts and somewhat violent in operation.

The more the writer sees of this type of mechanism the more admiring he becomes at the relative dependability of a weapon that, in theory at any rate, should hammer itself into fragments in quick time.

The two guns considered are gas operated. Good, recoil operated guns should be able to keep in action for the requisite periods, and be better able to resume their fire after long pauses without cleaning of the working parts, but they are often designed with a rather large number of somewhat more delicate components and—if exposed to dirt—may be more reluctant to function with poor ammunition.

The Madsen is a good example of the type and possesses many excellent features and several serious drawbacks.

The Browning, a gas-operated weapon with a toggle joint mechanism instead of the more familiar turning bolt, is capable of being made a very valuable and efficient weapon, although in its original form it falls a good way short of the ideal.

The extension of normal fighting ranges for the "heavy" type machine gun has been touched on. One basic difficulty is observation of fire which, however, the writer proposes to pass over in order to touch on the question of gain in ranging power of small arm cartridges of existing bulk when stream-lined projectiles are considered in substitution of those of normal, flat base design.

The stream-lined bullet—as most readers are well aware—is a bullet with a tapered rear end or tail, a form designed for the reduction of air resistance during flight. The French "Balle D" and the Swiss rifle bullet are of this form, and experience gained with a .303" bullet with a 9° slope of tail evolved by Messrs. Nobels for use at Bisley by match rifle shots—of which the writer is one—resulted in the publication by the makers of a pamphlet from which the following comparative figures are derived.

It is stated that the Service Mk. VII bullet and the Bisley stream-lined bullet of equal weight (174 grains), both fired from the Service Mk. VII case with an equal muzzle velocity (2,440 f.s.) should give an extreme range at 30° elevation of 3,300 and 5,500 yards respectively.

The maximum height of trajectory at 500 yards is 20 per cent. and at 2,000 yards 39 per cent. less in the case of the stream-line type, while the deflection due to wind is also some 35 per cent. less.

The comparative figures for remaining velocity and striking energy are given as :—

Service Mk. VII.			Bisley Stream-line.	
Range.	Remaining Velocity F.S.	Striking Energy F. lbs.	Remaining Velocity F.S.	Striking Energy F. lbs.
1,000 yards ..	997	386	1121	488
2,000 " ..	587	134	747	217

All this is extremely attractive, but unfortunately there are other factors that affect the situation from the service point of view, the chief of which is the extreme difficulty of making this type of bullet shoot with a degree of accuracy equal to that of the flat-based type in the average barrel, and the almost total impossibility of getting any accuracy at all worthy of the title when a barrel, and particularly the "back end" of the barrel, is much worn.

This is a very serious consideration when it is realized that machine gun barrels are none too long lived at the best of times, and that so much of their fire is over troops. The fact that bullets of this type are more expensive to make than the normal type may not be a very serious consideration, but the fact that it is far more difficult to produce correctly is a matter of considerable moment in times of stress when ammunition is required in vast quantities and has to be made by all kinds of people.

For use in rifles and light automatics the stream-line bullet is not likely to provide advantages commensurate with the increased difficulty and cost entailed, and although a certain extension of "battle-sight" range might be of some benefit to the former, the "flatter" trajectory might not be entirely advantageous to the most profitable use of the latter, and—whatever is used for the heavy gun—it would hardly appear sound to depart from the principle of unification of ammunition for the other two types of weapon.

While the actual weapon is not a special type, the attack of aircraft differs so materially from other forms of machine gun use that it comes very near to being a separate study. The weapons under consideration are likely to have as their principal objective, low flying enemy aeroplanes attacking troops at rest or on the march with machine gun fire. The writer has heard it argued that the real antidote for such incidents is well organized counter 'plane defence, but be this as it may, some means of "self-defence" appears necessary.

It is a "driven partridge" problem, and the weapon and its mode of use appear to be based on more or less parallel considerations. If the analogy is correct the essentials are a gun that "comes up" quickly combined with not too close a "pattern" as the opportunities are fleeting and the angular movement of the target is exceedingly rapid.

The condition of "come up" is a question of gun mounting.

Seeing that is impracticable to obtain the requisite "pattern" by means of the shot gun system of multi-projectile cartridges, the only alternative is to obtain so far as possible a corresponding result by releasing the individual projectiles from one or more barrels in rapid succession.

This suggests that the ideal weapon for the purpose is one giving a considerably higher rate of fire than that best suited to normal ground use and by means of which the conditions of spread and tailing of a shot charge can be reproduced. The system has one grave objection, in that it necessitates the provision of a weapon not normally in the hands of units, and one difficulty that appears to exist in any case is the fact that in all probability and in the majority of cases every second expended in getting such weapons into action seriously militates against the chances of success and appears to be of the greatest moment in the case of troops in column on roads.

Some types of gun have a marked objection to operating efficiently at considerable elevations and cartridge "feed" is apt to become

inefficient when weapons have to be handled like game guns, a point clearly favouring drum or box systems of "feed" as distinct from hoppers, links, strips and belts.

All that can suffice is actual hits with A.P. bullets on the few really vulnerable portions of the 'plane's anatomy or on the pilot, for—so far as the writer can appreciate the conditions—nothing short of evidence of material damage, or of its extreme probability as manifested by bursting shell, is calculated to encourage the enemy to fly high, which is the most profitable result short of actually "bagging" him.

A heavy projectile may be taken as capable of producing greater material damage, but a heavy projectile with an equivalent time of flight means a heavier and less handy weapon, and is rather like taking on down wind partridges with a 4 bore.

From driven partridges to buffalo is a far cry, but the diversity in type is hardly greater than that between low-flying 'plane and anti-tank shooting. Like the nigger, the tank's soft spot is his legs. Realising to the full the extreme complexity of the problem of tank attack, the writer disowns his ability to provide a solution from the weapon, and still less from the tactical point of view. He is, however, fairly convinced that his opening analogy is substantially correct and regards a tank, that has been "shot in the legs" as capable of being dealt with in leisurely manner, and of presenting a spectacle of dethroned majesty without parallel in modern land warfare.

Some people will argue that anti-tank shooting is not a small arm business at all, but a gunner job, conducted either from normal gun positions or from a species of "tank-destroyer-tank," suitably gunned and designed to have "the legs" of the enemy machines. Tanks advancing over stretches of open country are no doubt suitable objectives for artillery fire, provided the guns employed are so mounted as to be really suitable for laying on rapidly moving targets. The tank, considered from almost any angle, induces the opinion that if struck by light H.E. shell almost anywhere on its surface it will in all probability be put out of action. The old theory of "like repels" may favour the policy of the "tank-destroyer-tank" as it applies in the case of aircraft, but the extent of modern fronts is apt to discount the certainty of counter-tank action when necessary.

America and certain other powers have devoted much attention to the development of heavy machine guns around half-inch calibre for use against tanks, and there is little room for doubt that the projectiles employed are capable of perforating ordinary tank armour except perhaps at fairly considerable angles to the normal and at extended ranges. Such projectiles may pass through the protecting armour and themselves do damage or may produce flakes or splinters of metal that may cause injury to crew or mechanism.

During certain stages of an encounter—and more probably in its early stages—it appears possible that tanks will be enabled to make use of ground favourable to their concealment, and if this be so, tanks

cropping up at decisive range and moving at speed may need to be handled in the absence of artillery or counter-tank support, and it is this nature of incident that strikes the writer as more essentially an infantry affair for which some provision must be made.

Some have argued that air reconnaissance will reduce the possibilities of dead ground, and such surprise attacks, to their lowest terms, that commanders will be able so to dispose anti-tank weapons and counter-tanks that areas favourable to concealed approach will be kept under observation. Some others have visualized an entire front dotted with anti-tank guns as closely as lobelia in a Victorian garden.

The German reply to the tank menace was the production of an anti-tank rifle; a pre-historic looking structure reminiscent of the Chinese wall piece, having a calibre around .6" and using A.P. ammunition of considerable power. It was heavy, clumsy and crude; it needed to be the first as its recoil was appreciable and the bolt action must have been infuriatingly difficult to manipulate.

Machine guns of equal power are heavy and so is the ammunition, and the transport of the latter in quantity compatible with the rate of fire of these weapons is rather a serious consideration. If accuracy of fire is required—and it appears essential to success—a steady mounting of appreciable weight follows as a natural consequence.

It is possible to design such a mounting with a cranked axle-tree and light, broad tyred wheels, capable of being drawn by a mule and man-handled into position. The gun could either fire with the wheels in position or after their removal.

A much favoured alternative is the splitting up of the equipment into a number of one-man or two-man loads. Portability under such conditions is not purely a question of the dead weight of such individual loads, and as the number of men necessary to carry the collective loads increases, so does the possibility of casualties increase the risks of the equipment reaching the required position minus some vital portion.

The writer states, but not without some feeling of apology, that he has always harboured a certain sneaking regard for the basic principle of the anti-tank rifle. He visualizes a quick-loading, single-shot weapon equal in ballistic power to the best machine gun and provided with some form of short and strong action in some degree automatic.

Such a weapon, together with a sufficient number of rounds, would constitute two one-man loads, while—at a pinch—the weapon and quite a useful number of rounds could be got into action by one man and might produce a very great deal more result than no gun at all, the point being that it could always "get there."

Such a weapon could be produced fairly rapidly and at relatively low cost, and although the rate of fire obtainable would be nothing approaching that of the machine gun it would be appreciable and the accuracy be as great and possibly even greater.

The whole anti-tank question represents about the most important small arm problem so far dealt with, and the writer does not provide the answer for the simple reason that he does not know the answer. There are plenty of theoretical antidotes for tanks as there are quack remedies for the more popular diseases.¹

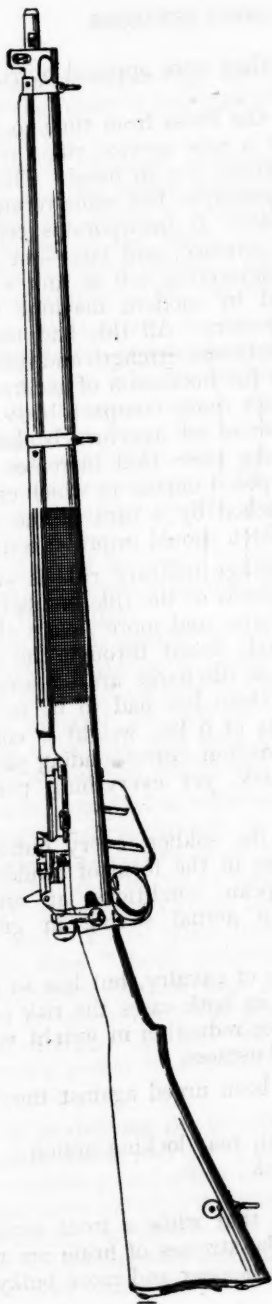
Prior to the War it was no unusual thing to hear the British service rifle spoken of by critics as a most ill-designed and inferior weapon, and war experience has shown how vastly inferior were their opinions.

It is fairly common knowledge that a new design of weapon of .276" calibre, of higher muzzle velocity and with an action on Mauser lines had emerged from the experimental stage a short time prior to the War, and the fact that the actual process of re-armament had not commenced by August, 1914, is one of the greatest and less recognised matters for congratulation. This weapon afterwards became familiar as the 1914 or Sniper's rifle, which was, however, provided with a .303" barrel.

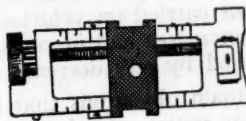
It is safe to say that the Short Lee-Enfield was less of an engineering proposition than any of its foreign contemporaries, and although some parts of it were extremely difficult to make properly, and the maximum resisting power of the action was inadequate for the stresses imposed by some more modern natures of high power cartridge and, further, that in spite of the fact that it was not an ideal target weapon, it possessed certain characteristics of such military value as to put many theoretical considerations and more mechanically perfect weapons in the shade when the supreme test of war was applied. The characteristics in question—briefly summarised—are light weight, good balance, more shapely stocking, an easy trigger action and a light and easily operated bolt with short "draft"; in fact all that makes for rapid operation and good snap shooting combined with an almost "sloppy" mechanism that continues to operate in spite of rust and dirt and gross ill-treatment.

Critics will continue to preach the theoretical faults of the action and that the advantages detailed are purely accidental. If we review the weapons of other great powers; the American Springfield with its strong action, short accurate barrel and powerful cartridge, the German Mauser with its strong, easily stripped bolt, that grand old man of magazine arms, the French Lebel with its elementary trigger, tube magazine and great length, or the Russian "3 line" Nagent with its clumsy bolt and miserable stocking, we see a diverse variety of practice, but all lack that light bolt action and game-gun "feel" of the British weapon; the rifle that on certain occasions in the early stages of the War and in the hands of a superbly trained personnel, caused doubt in

¹ No reference is made to "Infantry Accompanying" weapons of heavier type as—in the majority of cases—they are not strictly in the small-arm category.



SKETCH OF THE LATEST MARK OF SHORT LEE-ENFIELD RIFLE



DETAILS OF
BACKSIGHT.

the enemy's minds as to whether they were opposed by rifle or machine gun fire.

Reference has been made in the Press from time to time to statements regarding the adoption of a new service rifle, and it is fairly common knowledge that modifications are in hand. This latest Mark of short rifle is based on no new principle, but while retaining the most valuable features of its predecessors, it incorporates certain features shown to be desirable by war experience, and last—but by no means least—it is as much a modern engineering job as any weapon in the world, capable of being produced by modern machine methods and without the assistance of witch-doctors. All this had to be achieved without prejudice to balance, feel, lightness, strength and reliability. The new weapon is designed to provide the maximum of accuracy at normal fighting ranges, has a stronger and more compact body and bolt, a compact, sturdy and accurately screw set aperture backsight without lateral adjustment, a button cocking piece that increases the comfort of handling, a light nose cap, an exposed muzzle to which either grenade discharger or bayonet can be attached by a turn of the wrist, and a chequered forend and butt plate which should improve control.

The stresses to which the average military rifle is subjected are extremely severe, but the modern needs of the rifle bomber have caused it to be subject to stresses still greater and more severe although of a somewhat different order. The back thrust through the structure to the point of support due to grenade discharge are so severe that the capacity of the rifle to withstand them has had to be most carefully watched. To build a rifle in excess of 9 lbs. weight is comparatively simple, but to reduce this figure without corresponding sacrifice is an extremely difficult and anxious task, yet everything points to the desirability of such action.

For a given weight limit on the soldier, every ounce saved in weapon weight can be taken as gain in the form of rounds carried, a consideration which—under European conditions at any rate—is probably more important than an actual saving in gross weight carried.

Weight is important in the case of cavalry, but less so in the case of weapons carried on vehicles, but in both cases the risk of injury to weapons increases and in consequence reduction in weight must not be accompanied by any decrease in robustness.

The main objections that have been urged against the Short Lee-Enfield by critics are three:—

- (1) The unsymmetrical, rear locking action;
- (2) The two-piece stock;
- (3) The light barrel.

In regard to (1) it may be said that while a front locking action of the Mauser type is stronger and the stresses of firing are more symmetrically resisted, the action is both heavier and more bulky, the bolt

action longer and slower and the mechanism more liable to be rendered inoperative as the result of presence of rust and dirt, which is also more difficult to remove.

Concerning (2), the chief advantage is economy in timber—no small matter. It is by this means that we can cut our wood to the best advantage and yet avoid a straight Continental type stock. Japan splices on the toes of her butts and some powers use a cheaper and inferior variety of timber, which is usually either heavier or weaker than the walnut best suited to the purpose.

Objection (3) is correct in the sense that the short barrel is too whippy to provide the highest degree of accuracy as normally "stocked up," but the weapon was not designed as a target weapon in the full sense of the word, and although the intention is to improve the condition of things in the latest Mark; the scope is limited by considerations of weight and the intention aims as much as anything at avoiding the complication that arises due to the necessity for making special provision for snipers, although the gain in other important directions is recognised.

The question, if discussed further, introduces fascinating but complicated points of barrel vibration and compensation which are outside the scope of this article.

Reversion to the system of attachment of bayonet to barrel may cause an outcry on the score of possible barrel injury produced by bayonet fighting, but it is well to bear in mind that in most cases—and in that of two-piece stocked weapons in particular—the barrel is the main girder of the structure, and that the forend is attached to the barrel and action and not the barrel and action to the forend.

An article that makes reference to change in service rifle design would be somewhat incomplete if no reference is made to the time-honoured topic of a decrease in calibre. The writer is open to conviction on any subject, but is bound to confess that the claims of the champions of the "high power, ultra small bore" for military purposes are apt to leave him cold. To be quite frank, he has a somewhat deep-rooted antipathy to these "dance programme pencil" projectiles, not on the score of inaccuracy because some are extremely accurate; not because he is not in sympathy with the principle of giving the man the lightest weapon and cartridge that will "do the job," but because he does believe in the stopping power of a bullet with a larger cross-sectional area in rifles and pistols.

There is no denying the fact that such cartridges as Holland's .240" with 100 grain bullet and 3,000 f.s. muzzle velocity are excellent, both as regards accuracy and effect on game. Many people of the writer's acquaintance have extolled the virtues of this fine cartridge as the result of actual stalking experience, and have pointed to its value as a military project, but in so doing they have ignored the fact that the Hague does not control the laws and customs of game shooting and, in some cases at

any rate, appear to forget that they base their experience on the use of bullets that are of the expanding type in some form or another.

If their stalking had been conducted—as mercifully it was not conducted—with bullets of strictly military type the story of their exploits would have had a different ending, and although the stamina of the Scotch Red Deer is likely to compare favourably with that of the more weedy variety of conscript it must be borne in mind that gentlemen of considerable physical vitality and fanatical tendencies occasionally elect to assume the role of targets with some definite display of enthusiasm, and it is probable that certain episodes in British history would have been materially different to what they are had the Afghan, Zulu or Dervish at his best been opposed by lighter bullets of the nature referred to.

Small bore barrels are not easy to keep in good condition even by sportsmen who are usually in possession of far more efficient cleaning appliances than those with which the soldier can be encumbered. If we need stopping power, a well sustained striking energy, and relatively easy cleaning in the field, the writer is strongly of the opinion that any reduction in calibre below .30" is undesirable. The question of reduced recoil is often advanced in support of the use of very light bullets, but—within reasonable limits—he does not regard recoil as a matter of very great moment. How many people are worried by the recoil of the .303" after they have worked off their initial shyness and have learned to "hold," and how many of average physique have been unpleasantly conscious of the heavy recoil of, say, a .470" cordite express when shooting at game? War is such an uncomfortable business at the best of times that the small reduction in discomfort resulting from a still further reduction in recoil can hardly be justified if gained at the expense of adequate stopping power.

Considerable interest has resulted from the news that France and the United States have made a great deal of progress in the development of automatic rifles. It is understood that France has actually adopted such a weapon, while America continues with her elimination trials, which have included the Garrand, the Bang, the Thompson and other systems. The title automatic is used indiscriminately but is a misnomer, as weapons of the shoulder variety are not as a rule automatic but semi-automatic or self-loading, that is to say they are designed to fire one shot and no more with each pressure of the trigger, the method associated with the so-styled automatic pistols such as the Webley and Scott, Colt, Browning, Luger, etc., etc. The cycle of actions consequent upon pressing the trigger is the firing of the round in the chamber, the opening of the breech, ejection of the fired case, the re-cocking of the lock work and the loading of a fresh round. The ability to develop automatic action—or to "maxim" or "run away" as it is often styled—is regarded as an undesirable feature and, as such, constitutes one of the principal weaknesses of so many weapons of this nature.

The writer is of the opinion that the "self-loading" rifle will be the small arm of the future and that its introduction in place of the normal type is only a matter of years, but no design has come under his notice as yet that he considers to be sufficiently reliable to justify such replacement, and that hasty action in this direction might be fraught with calamitous consequences.

The requirements of modern war are so stringent—and none more so than in the case of Britain—that a weapon generally less reliable than the average magazine arm could not be entertained, but the great strides that have been taken by self-loaders during the last few years leave little doubt that a really serviceable type will evolve and, knowing the difficulties of the task, the author admits his unstinted admiration for inventors who have toiled at the problem and produced weapons that really do work even though at present they fall short of certain essential service requirements.

A weapon that requires "nursing," that is bulky or heavy, that requires frequent cleaning and much "stripping" for the purpose, is a positive abomination. The writer has seen many most ingenious solutions of the problem, but all have their ailments, as for example, guns provided with monstrous dust covers and flaps, fat, clumsy and quaintly shaped stocks, mechanisms that require to be constantly flooded with oil, small and often frail components that require frequent cleaning and—consequent upon the removal of a simple pin—have a habit of suddenly leaving their positions in coveys with considerable velocity and by diverse paths to inaccessible places, guns that after comparatively few rounds cannot be held without a glove, others that are prone to "Maxim," double feed, eject fired cases with undesirable violence in inconvenient directions or refuse to eject at all.

The advantage conferred by the self-loading rifle is ability to develop a volume of aimed fire of greater intensity than that from the most efficient hand operated magazine rifle in average hands. In the opinion of the writer, this result is obtained, not so much by the rapidity with which a magazine can be emptied as by the avoidance of disturbance and distraction inseparable from manipulation of a bolt. A parallel is the "gun" and his "loader." The experienced loader in a warm corner concentrates on the loading and the changing of the guns, while the experienced shot does not look at his loader but concentrates his attention on a rapidly changing situation. The possessor of a self-loader is placed in a somewhat similar condition, within the limits of his magazine capacity, and—in the case of men trained to work in pairs—his grasp of a critical situation is even more complete.

It has often struck the writer that cavalry units so armed and operating in close country could—on occasion—suddenly develop an accurate and intense fire at close range with valuable results, and that given a weapon of reasonable weight, say 9 to 10 lbs. at most, their mobility should not be impaired.

Opponents of the "self-loader" policy—and they are fairly numerous—usually take up their final stand on the time-honoured difficulty of ammunition supply.

The question is certainly one of increased importance all round, and the safeguard against waste presumably is—as it always has been—a question of training and fire discipline. The idea is not to provide for "hose pipe" fire at all times, and there is no definite reason why the difficulty of ammunition supply could not be overcome, but the main question does not appear to be "is it possible?" but "is it worth while?"

The British service cartridge case, although excellent in many respects, is not an ideal type for use in "self-loading" weapons in which "feed" is more rapid and magazines are usually of somewhat increased capacity. Rimmed cartridges do not lie so well in magazines as do cartridges of the rimless type, neither do they "feed" quite so dependably. The latter type usually permits of a somewhat less bulky charger or clip, but they are rather more difficult to make with sufficient accuracy as to ensure positive location in the chamber of weapons. Much could be written on the subject, but such fine points of detail are dealt with in text books and are not suitable for discussion in an article of this nature and length.

So much mention having been made of accelerated rates of fire in one direction or another, the question naturally arises as to how barrel life or accuracy is to be preserved, and the old enemy of accuracy—metallic fouling—is instinctively brought to mind.

It is more prone to occur when the temperature and rate of fire is high, and these conditions (aggravated in the case of machine guns), and its effects become more serious again on account of the extensive employment of overhead fire. The condition appears to be one of incipient seizure, which can be alleviated by suitable lubrication, but the difficulty of applying such lubrication—and particularly so when stream-lined bullets are employed—tends to show that the most practical palliative is probably the development of more suitable materials for bullet envelopes.

On the subject of pistols in general there is little to be said. Hitherto little interest has been taken in pistol shooting in this country compared with others—notably the United States—but interest is likely to increase in the future in view of the more extensive allocation of this arm to various branches of the service.

The slow, deliberate methods of practice are apt to cause pistol shooting to be viewed in the wrong light and—except perhaps in the preliminary stages—quick drawing and handling and snap shooting at short ranges is the real essence of the art. Pistols of several makers were issued during the War, all chambered for the service .455" cartridge, and chiefly of Webley, Colt and Smith and Wesson make and design.

For use by all arms the Webley "break-down" type of action is usually favoured as being more easily operated than the "swing-out" actions of the Colt and Smith and Wesson, both of which have hand operated ejecting systems, and are far more "two-handed guns."

All types have their good points, but all fall short of the author's ideal, but it is so much a question of small detail and individual taste differs hardly less in pistols than it does in shot guns. It may be said that comparative lightness, easy trigger action, a roomy grip, easy cocking and instinctive alignment are essentials in design, and with these qualities must be combined a bullet that hits hard and sticks tight. In this respect the .455" cartridge is excellent and so are certain .38's, and if a change is effected a pistol of decreased weight and bulk incorporating the essentials enumerated above and of the last named calibre would probably take the field.

At one time "automatic" or self-loading pistols bid fair to replace the revolver in most armies, but experience with them in war has produced a strong reaction in favour of the older weapon. These "self-loaders" are flat, compact weapons, well suited to carrying in the pocket, but from the strictly service standpoint, which favours easy, single-handed operation, ability to withstand exposure to rough usage, neglect, rust, sand and mud, not to mention safety in use and freedom from accidents during training, they do not improve on acquaintance.

Expenditure on experiment in times of peace—and particularly during the reactive period following a lengthy and exhausting conflict—is usually unpopular with the general public. Re-armament on an extensive scale—at any time a difficult matter—becomes increasingly difficult, but none the less it is a fact that a public that is only too ready to denounce such expenditure in peace as spendthrift, is still stronger in its denunciation when war comes and the services are found wanting in material suitable for a diversity of up-to-date needs, and the services—powerless in either case—are blamed for the sins of commission and omission. While the possibility of war exists—however remote such possibility may be—neglect of that form of national insurance, the premium on which is represented by expenditure on the exploration of the possibilities of improved forms of war material, the selection of the best and most efficient forms and the essential arrangements for their rapid and economical production in emergency, is liable to prove calamitous.

When faced with such apparently paradoxical conditions of development as are in evidence to-day, the problems of armament are complex for any power, but in the case of Great Britain, who may be required to operate under so vast a variety of geographical and climatic conditions beyond the seas, the solution of the problems is of infinitely greater difficulty.

In order to turn such funds as are forthcoming to the best account, it is essential that the fighting and technical sections of the organization should work in intimate relation and with mutual sympathy for the needs and the difficulties of one another, and always with an eye to the needs of the future rather than those of the present.

The regimental officer, by cultivating the technical outlook within certain limits, can do much to make the soldiers' weapons perfect in essentials, and by cultivating the "long view" without becoming either visionary or fanatical, he can bring to light many small but valuable points that can be turned to profit when circumstances permit. Suggestions are and should be welcomed, and it is far better to expend many hours on the investigation of proposals that prove worthless, than run the risk of missing one that is really valuable.

Civilian gun making is an art pregnant with individuality and it caters for individual tastes, but the design of service weapons must aim at rapidity, economy and simplicity in bulk production, and, as the process of evolution proceeds and requirements become more and more exacting, both from the standpoint of quantity and refinement of detail, the difficulty of a difficult task increases. A man ordering a new pair of guns would not enter a shop and say "Make me a pair of guns, light ones!" and dash out again. If he did so he would hardly be a deserving case for sympathy if the resultant weapons differed in some respects from those he had pictured in his mind's eye. People should consider their needs and be capable—whether the occasion arises or not—of giving clear expression to them.

In explanation of the gun shop analogy, the writer desires to add with necessary speed that it does not represent his experience, which has been an evident and increasing desire on the part of regimental officers that he meets to discuss the finer points of material and to take opportunities of augmenting their technical knowledge of those branches of the subject that—under normal conditions—are less easy of access. He hopes it is a sign of the times which augurs well for more efficient equipments for the safe-guarding of the Imperial fabric.

A REMARKABLE RAID. EAST AFRICA 1917.

By COLONEL G. M. ORR, C.B.E., D.S.O., p.s.c., Indian Army (Retd.).

"SO ended a remarkable raid." Such were the words with which General Van Deventer closed the allusion in his despatch dated 21st January, 1918, to the operation narrated below.

It came about in this wise. By the end of January, 1917, the German forces in East Africa had been driven south and east of the line of the Rufiji River and its southern tributary, the Ruhuje.¹ In the east was the main force which, under Lettow's personal command, was beginning to move south, and to extricate itself from the swamps of the Rufiji valley. To the west and south-west, under the general control of Lettow's lieutenant, Wahle, were the companies which, coming south-east from the Tabora area, had linked up with the detachment hitherto facing the British advance on Iringa from the Rhodesian frontier. On the British side the main force of, roughly, three brigades, was endeavouring, from Kilwa on the one side, and from the bend of the Rufiji on the other, to cut off Lettow. Based on Iringa and the Central Railway was a small column watching Wahle's detachments west of Mahenge. Further south, based on the north end of Lake Nyasa, General Northey's columns were disposed on a very wide front with the intention of driving the enemy further east into the Luwegu valley. Thus, in addition to a column at Lupembe, there was a column under Murray a little east of Iringa in touch with Kraut's detachment of six companies; fifty miles further south a small column under Tomlinson had become hemmed in by Wintgens' detachment of four companies at Kitanda; while some twenty-five to thirty miles further south-east another small British column, detached from Byron's column at Songea and to which a German detachment of two companies had just surrendered, was moving to Tomlinson's aid. In rear of these columns Hawthorn's column was approaching Wiedhaven, and a column for the protection of the line of communications lay at Tandala. Northey's headquarters were at Nyombe (Ubena), while his lines of communication ran from (a) Old Langenburg via Tandala and Nyombe to Lupembe and Iringa, and (b) Wiedhaven to Songea.

Wintgens, threatened from the south-east, broke past Tomlinson westwards to Gumbiro. Here he was joined by Kraut. It would

¹ See Map, facing p. 80.

seem that Wahle was finding great difficulty in organising any supply system for his columns, and had instructed Kraut and Wintgens to move to the Songea area, where they might live on the country. At Gumbiro, however, they could get nothing, so Kraut decided to obey Wahle's instructions, and move south; on the 10th of February he appeared on the Wiedhaven—Songea road. Not so Wintgens, who appeared in front of the Milow Mission due west of Gumbiro. What decided Wintgens on this step and his subsequent move to the north is not known. There is nothing to show that the operation was embarked on with any particular intention. It was certainly not inspired by the German Command, or even done with its consent. In its effect on the main operations it may either have been a serious raid on lines of supply designed to surprise isolated posts and disorganise the plans of headquarters, or a detachment made with the object of diverting forces from the decisive point at the decisive time. Anyhow, it may be regarded as an example of what an operation planned as such can effect. Northey naturally thought Wintgens meant to attack his L. of C. between Tandala and Nyombe, and ordered Murray from Ifinga to Tandala, while Anderson from Tandala got in touch with Wintgens. Not only was Anderson's column driven back on Tandala, but reinforcements of a South African motor-cyclist corps and a company of King's African Rifles were in turn roughly handled and hemmed into Tandala. The approach of Murray's column, however, resulted in Wintgens moving north on the 22nd February, followed by Murray.

Wintgens left Tandala with 600 rifles, organised in four companies, with twelve maxims and two light field guns. Northey first made dispositions to cover Fife and Abercorn, but, realising Wintgens' course was set for St. Moritz via Utengule, he arranged for three columns to converge on St. Moritz. On the 13th March, Wintgens passed Utengule, and reached St. Moritz on the 18th, where he saw an opportunity of resting and sending out reconnoitring parties. The central column following his tracks through Utengule reached the vicinity of St. Moritz on the 21st, and without waiting for the co-operation of the columns from right and left, appear to have attacked, and was rebuffed. The necessary rearrangements did not bring all columns within striking distance until the end of the month. On the 1st April Wintgens crossed the Songwe River, and on the 2nd his direct pursuit was taken up by Murray with a column consisting of the 1st King's African Rifles and the 1st Rhodesia Native Regiment. Northey could spare no other troops from his long front, and it was some time before General Headquarters, at Dar-es-Salaam, could get together even a small column to join in the chase or block a movement to the north. At Morogoro and elsewhere battalions of King's African Rifles, newly raised to take the place of the South African battalions, were in process of training. At Tabora and in the north-west were the Belgian forces, but they were no longer taking part in active operations.

Murray, hampered by being dependent on supplies from the rear because Wintgens stripped the country as he advanced, was never able to bring the enemy's main body to bay. Meanwhile the appearance of Wintgens' patrols far to the west, as well as to the north, had cast doubts as to the direction of his further advance. G.H.Q. therefore, sent one of the new King's African Rifle battalions under Montgomery to Tabora to work southwards towards Kitunda, while another force was transported by the Central Railway to Ujiji, and thence by lake to Bismarckburg. But Wintgens continued along the north bank of the Songwe, as far as Uleia, and then struck north-east up on to the plateau, appearing at Nkulu on the 15th. He was now within seventy miles of Kitunda, which Montgomery had reached on the 5th. Murray, much delayed by an increasingly long line of supply, was far behind. G.H.Q. had by now formed another small column, which was detrained at Itigi about 23rd April, and ordered to Kiromo, whence it could act in conjunction with Montgomery. Wintgens waited till the 26th, and then moved against Montgomery, who unfortunately, found it necessary to retire back to Sikonge. Wintgens therefore settled down to rest at Kitunda, while his patrols again went far and wide. While at Kitunda he no doubt heard of the arrival of the Itigi column at Kiromo on the 30th, and of Murray at Nkulu on the same date. He was now on the border of the country whence his men were recruited, and it is somewhat remarkable that such a temptation to desert and rejoin their families should have had so little effect on his Askaris. While Wintgens continued at Kitunda, G.H.Q. were making arrangements to co-ordinate better the operations of the various columns. The Belgian commander's assistance was invoked, and he co-operated by reinforcing Montgomery with one battalion, and by sending another to Karema (on the eastern shore of Lake Tanganyika), whence it was to work north-east. The Bismarckburg column watched the road to Kitunda. The control of the operations was now put under General Edwardes.

Hearing of the close approach of his old enemy, Murray, as well as that of the other columns, Wintgens moved from Kitunda on the 16th May down the Ugala River to the north-west. On the 24th he found how close the net was drawing round him. Immediately north, and west, were the Belgian columns; behind him Murray had reached Kitunda on the 19th; and on the east the Kiroma column had closed in. He himself was a very sick man, so handing over the command of his force to Naumann, he bade his men leave him in a village on the Ugala.

Naumann, moving rapidly by night to the north-east between our columns, now headed for the Central Railway. The next day Wintgens was found by the Belgians. In recognition of his gallant bearing throughout the war, the Belgians allowed their old enemy to retain his sword. He was eventually sent as a prisoner of war to Egypt. No one had better reason to pay tribute to the military qualities of Wintgens than the Belgians. From the commencement he had faced

the Belgians in Ruanda. His command was the furthest removed from German H.Q., and he was left to fend for himself. With a nucleus of one company he had organised and trained several more, and by his leadership, energy and initiative, he had opposed the Belgians with considerable success in the region in which they were to develop their greatest strength.

To return to the story of the operations to catch the German force now under the command of Naumann. On the 23rd May, the day before Naumann broke away, there had been placed at General Edwardes' disposal the 4th battalion Nigeria Regiment, which had but just arrived at Morogoro for a rest after its most arduous sojourn in the Rufiji swamps. The battalion received orders to entrain the same evening, but for some reason, most unfortunate under the circumstances, its move was counter-ordered till the evening of the 24th. The first half of the battalion entrained at 9 p.m. on the 24th for Nyahua, a station thirty miles east of Tabora. Detraining there on the evening of the 26th, it received orders to go back twenty-six miles to Malongwe. It was known that Naumann was making for the Central Railway at this point—a piece of information which reflected great credit on General Edwardes' intelligence service. Now mark the chain of events which frustrated General Edwardes' plan. The first train did not reach Malongwe till daybreak the 27th. The second train with the rest of the battalion from Morogoro, although it had entrained at 2 a.m. on the 25th, did not reach Malongwe till 10.30 on the 27th. Meanwhile, Naumann's column had actually passed the railway during the night a mile or two from Malongwe. A small patrol from Malongwe came on a party of them at 7 a.m., but by firing on them, put the Germans on the alert, so that a stronger reconnoitring patrol moving out later was ambushed. Touch with the Germans was unfortunately lost, nor does the Nigerian battalion at Malongwe seem to have made any serious attempt to clear up the situation. The Germans had cut the wire between Malongwe and Tabora about eight o'clock, so that Malongwe was isolated from General Edwardes' H.Q. A repair party was sent out from Tabora in a motor tractor, and communication was reopened about 3.30 p.m., but in some unaccountable way a Nigerian patrol mistook the repair party for Germans, and it was taken for granted that the Germans not only held the railway, but had captured rolling stock. During the night of the 27th, General Edwardes ordered the Nigerians to pursue Naumann, who was now known to have camped ten miles north of the railway. During the night and in the early morning of the 28th the 13th Belgian battalion (native troops) joined the Malongwe column. At 6 a.m. on the 28th the pursuit commenced. For three days pursuer and pursued passed through an area of dense elephant bush. On the 4th June the Malongwe column completed 120 miles in eight days without getting touch with even a rearguard, and a day's halt became necessary to arrange supply matters. On the evening of the 5th a detachment of 200 picked Nigerian and Belgians, with four maxims, was sent ahead to gain touch with

the Germans who were reliably reported as bound for Mkalama. On the night of the 6th the detachment, which had just failed to cut off a German company rejoining its main body after a detour to Singida, was ordered to hasten on to Mkalama, where the police post held by six Europeans and thirty ex-German Askaris was being attacked. As Mkalama was approached on the morning of the 7th, opposition began to be encountered. By 4 p.m. the detachment was hotly engaged, and had to retire slightly to a defensive position for the night. At 1 a.m. on the 8th the column arrived, and at daybreak advanced—only to find that Naumann, having failed to capture the post after attacking for three days, had hurried on. Fatigue and lack of supplies again caused the pursuers to halt, and Naumann once more got clear away to the north-west.

No move was made until the 10th June, when a company of Nigerians were just too late to prevent the Germans crossing the unfordable Subiti River in boats. On the same day a British aeroplane, mistaking the Nigerians for the enemy, dropped darts on them, nor was there any means of informing the pilot that the enemy was only ten miles away. On the 15th June the column continued in Naumann's tracks and reached Terema on the 22nd. From here the Nigerians were recalled to Tabora, leaving the chase to the Belgians.

According to the despatches, it had been necessary to divert the equivalent of a brigade of British and a brigade of Belgians in the attempt to catch Naumann. Special arrangements had been made to meet Naumann if he moved west to the Mwanza district, and the British C.-in-C. had also felt it necessary to ask for a regiment of mounted rifles to be sent from South Africa to help in the chase. On the 18th June it was decided at a conference of the British and Belgian commanders that too many troops were being employed, and that it would be better to entrust the further pursuit to the Belgians with a homogeneous force. On the 28th June Naumann captured the post of Ikoma, where he was overtaken by the 13th Belgians on the 29th. A somewhat rash but very gallant attack was at once made on the Germans, which unfortunately met with a severe repulse. Naumann now turned east, which caused the British C.-in-C. to reinforce both the Magadi and Arusha areas with troops that had to be taken from his reserve and from the new battalions under training. On the 4th July the Belgians sent three battalions in pursuit from Ikoma carrying twelve days' supply with them. Touch was once more gained with Naumann on the 17th July at Engaruha, between Lakes Natron and Manyara. As his course seemed now to be laid on Ufiome and Kondoa—Irangi, the British C.-in-C. set in motion a new set of columns. Naumann's activities at this juncture were threatening to prove a serious menace, because troops diverted to his pursuit were those required to reinforce the columns of the Kilwa and Lindi forces for the next phase of the campaign, the object of which was to give the final blow to Lettow in the south-east.

To deal with Naumann it now became necessary to place 150 rifles of the Cape Corps at Kondoa-Irangi, to direct 400 rifles of the same regiment from Arusha on the same place, as well as a mounted column of 80 East African Boer settlers, and 100 King's African Rifles, and to form a reserve column at Dodoma. The latter was to meet the eventuality of his re-crossing the railway, while the troops at Kondoa were to prevent him going east; the task of the Belgians was to continue to drive him south. Naumann continued to work southwards, keeping west of Kondoa-Irangi, but sending strong patrols well out to his flanks. Then suddenly he turned east, and by night marches through thick bush, evaded the eastern cordon near Tissa-kwa-meda, and at the beginning of August was moving on Mt. Luita. The Belgians were now out of the picture, and were withdrawn. The Cape Corps and the mounted infantry from Kondoa, with the reserve from Dodoma, became one column under Dyke, to which was added the 10th South African Horse, as its squadrons arrived from South Africa, and, temporarily, a Nigerian battalion. Another column of newly-raised King's African Rifles was formed at Korogwe to move on Handeni. On the 13th August Naumann moved east from Luita towards the Nguru Hills. Headed off in that direction, he broke up into three columns. One column of 9 whites and 100 Askaris remaining in the vicinity of the Nguru Hills, were surrounded and captured on the 2nd September. The main column under Naumann moved rapidly north over the Masai Steppe, and on the 29th held up a train at Kahe near Moshi. The third column of three whites and 53 Askaris, keeping more to the west, made for Lake Eyassi, where it was forced to surrender on 2nd October to a detachment of King's African Rifles sent from Arusha. On the 1st September Naumann was reported to have again turned south. On the 8th September he was at Kidshungo, on the 15th at Gairo. The meshes of the net were now drawn tightly round him. The 1st Battalion Cape Corps closed in from north, north-west and west, while another portion of the same battalion closed in from the east and south-east. The mounted infantry company of the King's African Rifles clung close throughout. The King's African Rifle column from Korogwe closed in from the north-east, while the South African Horse came up from the south-west and south. Headed off by the cavalry, he turned once more towards Mt. Luita, where he was finally brought to bay. The South African Horse and mounted Infantry occupied the surrounding water-holes, and kept him in play until the infantry arrived. On the 1st October Naumann, with 14 other whites and 165 Askaris, surrendered.

The British C.-in-C.'s comment, on the raid as a whole, was that such a raid could perhaps only be carried out in a country like German East Africa, where the bush is often so thick that two considerable forces may pass within a mile, unaware of each other's presence; and where a ruthless leader of a small force can nearly always live on the country. More than one critic has put his finger on the dependence of the British columns on supply trains and their lack of ability to live on

the country—with the consequence that halts had to be called periodically and the enemy given the opportunity to choose his onward route. In all fairness it must be remembered that a system of living on a country which is sparsely inhabited by a people who grow little more than their daily needs, demands an organisation to be widespread in order to find the food, especially if the country folk are not to be injured in the process. The British columns were not at war with the people of the country, and it was a necessary policy not to denude them of their sparse supplies. In the case of the columns in pursuit of Wintgens and Naumann, even if they had depended on finding supplies and paying for them well, the Germans had been there first, so that nothing was left.

There is one criticism that seems justified. On more than one occasion commanders failed to take action to keep touch with their enemy, so that the troops were unable to reap the reward which their hard marching had deserved.

Let us now consider what effect the raid had on the operations generally. In the first place it must be clear that Wintgens embarked on his venture without the consent of German H.Q. and without any definite objective. Lettow, in his book, "My Reminiscences in East Africa," says "Kraut and Wintgens' forces were marched west to Gumbiro whence they were to press on across the Songea-Wiedhaven road. It was thought that they would find adequate supplies in the mountains south of Songea. The report of this move (*i.e.*, of Wintgens' to the north-west) reached me too late for me to interfere."

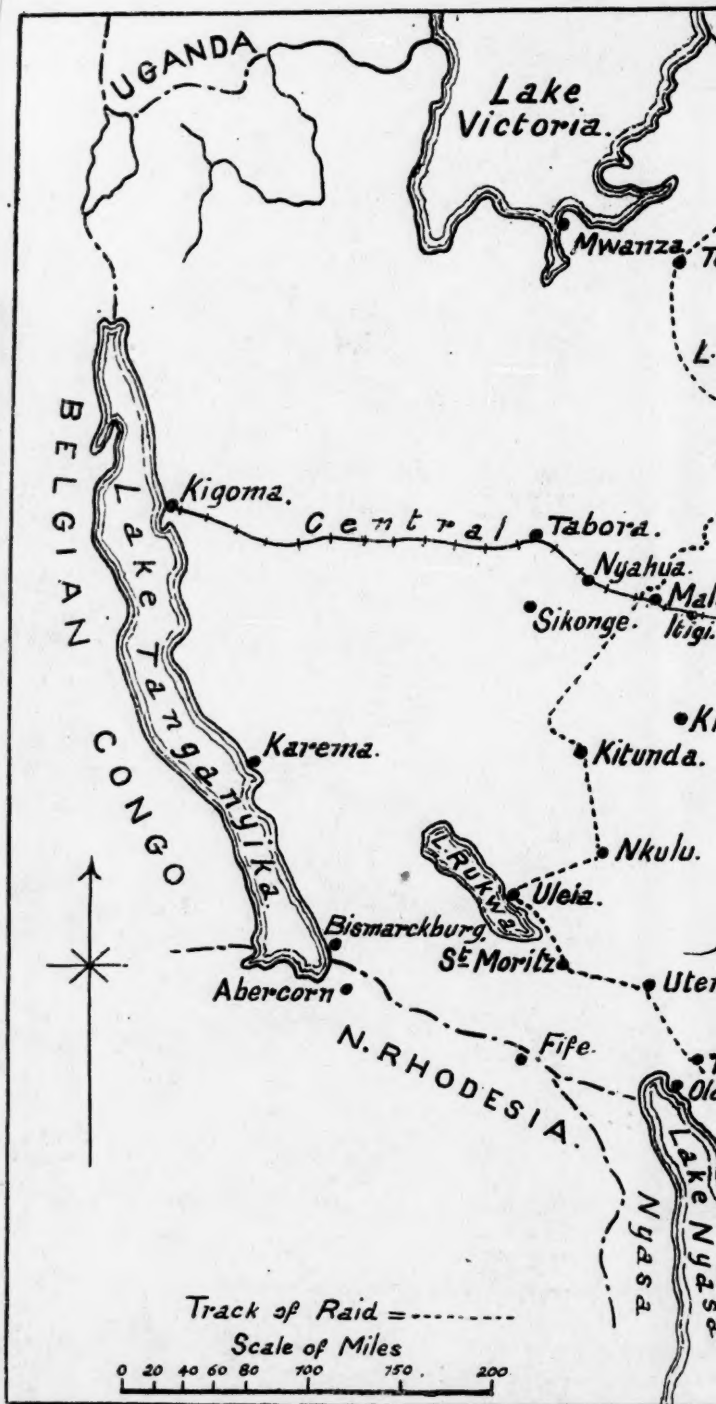
It would be interesting to know what took place between Kraut and Wintgens at Gumbiro. It seems more than likely that two years of independent command in the north-west had left Wintgens but little inclined to take orders or to place a proper valuation on co-operation. It is believed he had some feelings of resentment at Lettow's domination, and had expressed his opinion that he might have received more help against the Belgians. He was never afraid to express his opinion, and it is known that when the decision was made to evacuate Tabora and retire south of the Central Railway, he said the time had come to make terms. Knowing Lettow's determination to carry on the war, this was a courageous opinion to express. Although he had shown marked military ability and leadership, he was really the civil administrator of the district from which he had recruited the men of his companies, and in that capacity he may well have become attached to the people. He possibly lent a ready ear to the voices of his Askaris asking to be led back to their country. They had been long separated from their families and would have natural fears for their treatment at the hands of the enemy. Again, when Kraut and he came together he was probably put under Kraut's orders, for Kraut was the most trusted of Lettow's lieutenants, and, being jealous of interference, resented it. One wonders whether, if Wintgens had not fallen ill, he would not merely have led his men on into their country and dispersed. His successor, Naumann, was of a different mould, and showed, by the way in which he dealt with

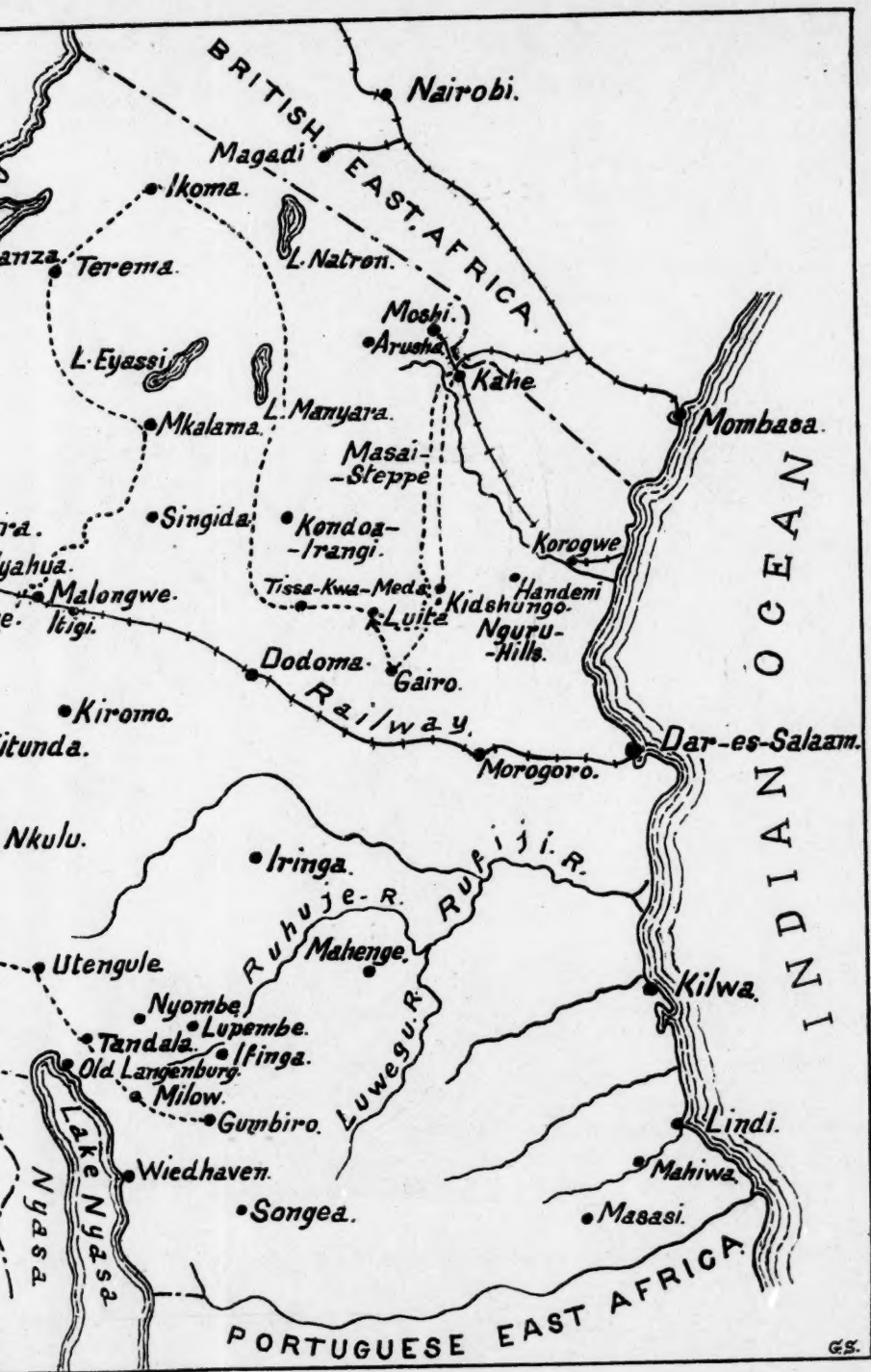
the people of the districts he passed through, that he was ruthless as well as determined. His behaviour at the end resulted in his trial by court martial for acting against the customs of war.

Assuming for the sake of argument that the operation was intended to do damage and be a diversion, one may say that the lines of communication, anyhow, came to no harm. Nor can it be said that the British plans were at any time disorganised. That the raid caused anxiety goes without saying, and, to deal with it, troops had to be taken from a much-needed rest or from their training. This was the sum of the disadvantages up to the middle of September. After that the effect became serious.

The campaign, which commenced in June, had resulted by mid-September in a situation which gave prospects of dealing a final blow to the enemy's main force under Lettow. The forces operating from Lindi and the Kilwa area had advanced so far that by the second week in October the position was such that the two forces could join hands in the Mahiwa—Masasi area in the following week. The successful accomplishment of this, however, depended on the Lindi force being able to clear the way through Mahiwa down the Masasi road. From the 14th to the 18th of October there took place the action of Mahiwa, which resulted in the Lindi force being brought to a standstill. Now the troops which could have been used to strengthen the Lindi force were those which had to be employed against Naumann in September. It is true that the surrender of Naumann released them on the 2nd October, but it was impossible for them to have reached Mahiwa by 15th October. By reason of the hoped-for results of a successful action by the Lindi force at Mahiwa, and the consequent junction with the Kilwa force, Mahiwa must be looked on as a decisive point, and mid-October as a decisive time. Viewed in this light, the equivalent of some two or three battalions was kept away from the decisive point at the decisive time by the action of under 600 men. Further, if those two or three battalions had been present, one can confidently say that their addition would have meant victory to the British, even if the 600 had been added to Lettow's force.

It may be accepted, therefore, that Wintgens' venture, starting in February, unintentionally was the means of our lack of success in the third week of October. But one cannot argue from this that it would have been justifiable strategy to have committed Wintgens' detachment to a task in February in order to achieve a result in October. Lettow's own comment is: "It is regretted that this operation, carried out with so much initiative and determination, became separated so far from the main theatre of war as to be of little use." From which it may be reasoned that Lettow would have found a use for the detachment which would have weighed favourably in the balance against an increase in the strength of the force opposed to him. But without such optimism Lettow could never have conducted the defence of German East Africa in the way he did.





THE TANK.

"FULL CIRCLE GOES THE WHEEL."

BY CAPTAIN AND BREVET-MAJOR H. G. EADY, R.E.

THE battle was over and the issue decided. The victory had been gained by an arm somewhat new to the force that had employed it, and the time for decorating the victorious commander had arrived. He, however, strenuously declined the rewards, exclaiming: "we ought rather to blush that we owe our victory to these brutes!" This was not the remark of that typical reactionary British officer, so dear to the heart of the journalist, after a successful employment of tanks, but was that of Antiochus after he had won a victory for the Syrians against the Galatians in 275 B.C. by means of sixteen elephants. The tank of that day had proved itself the dominating factor.

The modern tank has often been compared with the chariot and with the knight in armour, but the analogy between it and the war elephant is much closer, and it is very interesting to notice that the evolution of tank and anti-tank tactics, no less than the early mistakes made in the employment of tanks, are almost identical in the case of elephants.

GENERAL HISTORY.

Elephants were undoubtedly used for war purposes in the East from a very early period, those fabulous persons, King Amoraëus of the Indians, and also Semiramis, both being reported to have had 10,000 elephants in their armies but the period of real interest from the point of view of such a comparison with modern tactics dates from about 327 B.C., when Alexander first encountered the elephants of Porus at the crossing of the Hydaspes. The military era of the elephant, so far as western military affairs are concerned, was thus started by Alexander, and was ended by another great leader of antiquity, Cæsar. From the time of Alexander, one sees the gradual introduction of this new engine of war into western armies, in spite of considerable prejudice against it. Even the Romans, who stood out the longest against the elephant, largely, it is conjectured, because of the difficulty of obtaining the animals, were eventually forced to adopt them; and it is of interest to note that in the treaty signed by Carthage with Rome after the Second Punic War, the former bound itself never to employ elephants again in war. It is of interest, also, to notice that the gradual

increase in reliance on these and similar forms of "mechanical weapons" for the gaining of the battle was accompanied by a gradual deterioration of the infantry of the period. The general history of these 300 years represents an almost complete phase of the everlasting struggle in war between offensive and defensive arms and methods.

Owing to the untrustworthiness of many of the early accounts of battles, especially with regard to numbers, it is difficult to obtain any definite figures as to the number of elephants employed, but the maximum, so far as the Mediterranean countries are concerned, appears to have been forthcoming at the battle of Ipsus, where, according to Plutarch, Antigonus had 75 elephants against 400 of the enemy. As a general rule, however, they appeared in numbers similar to those in which tanks might be expected, *i.e.*, from about the sixteen, with which Antiochus Soter defeated the Galatians, to anything up to 150.

Directly the great importance of these animals for war purpose was realised, there apparently came the usual swing of the pendulum of public opinion, and it was soon considered, except in Rome, that they were really the only essential victory-winning weapon. The standard of infantry deteriorated, whilst the "elephant corps," or its equivalent of those days, became very powerful. The head of this corps, the "elephantarch" or "magister elephantorum," became a man of great importance, and was in most cases of the highest rank. He was, indeed, often found in argument—and successfully so—with the commander of the army.

An elaborate organisation or war establishment was gradually built up, again almost exactly similar to that of the modern tank. The elephants were grouped in brigades of sixty-four, each brigade being divided into divisions and sub-divisions as follows:—

(a) Phalanx	This was the brigade of	64 (Tank Battalion).
(b) Ceratarchy	Half Phalanx	32.
(c) Elephantarchy	A Division of	16 (Tank Company).
(d) Ilarchy	Sub-division of	8.
(e) Epitherarchy	Section of	4 (Tank Section).
(f) Therarchy	Half section of	2.
(g) Zoarchy	Single elephant, which was looked upon as the tactical unit of the phalanx ¹	

Their training was difficult, as the number of men accustomed to look after them and to drive them was small, and yet the training of the animals was of supreme importance. They had one great disadvantage not possessed, fortunately, by the modern tank—if they were ill-trained, or if their attack were beaten off, they would probably

¹This nomenclature is taken from Armandi's "Histoire Militaire des Eléphants." This author gives the organization cited by the Greek historian, Aelian, "de distruend acieb. apud veber. rei militar. script"; 'ed. Stawech, p. 325.

turn and break their own side. To try to prevent this, the usual method of training was as follows:—the elephants were drawn up and made to advance against men with slings, etc. The latter fired at the animals as they advanced, but only sufficiently strongly to irritate and pain them, but not to damage them. The animals then tried to turn round. Immediately from other troops stationed behind them, a volley of a much more painful nature was poured into them, and thus they were gradually taught that it was less painful to go straight on at their enemies in front of them than to turn round and go back!

There was another point of interest that appeared soon after the introduction of this new method of war. Alexander's elephants, and most of those of the early period, were obtained from India, a source of supply which was denied to some nations. Exploring and hunting expeditions were consequently sent into Africa to obtain animals from those parts; but the African elephant was found to be practically useless against the Indian animal. It could never be properly trained to withstand the pain and fright of war conditions, and the demand for Indian animals became very great in consequence.

OFFENSIVE ARMAMENT.

In using elephants for offensive purposes, the soldiers of the day employed them in almost the identical manner in which tanks were used. They relied on the moral effect on the opposing personnel and horses, on the crushing power of the elephant itself, on its mobility, and on the fire effect from the tower carried on its back. At times, elephants were used without these towers simply for their breaking effect on the lines of the enemy, but usually they carried towers from which fire from bows, slings, and javelins could be poured on the enemy. These towers seem to have varied very much in size and type, the historian of the Maccabees reporting that thirty-two combatants were carried in each elephant tower in the army of Antiochus! Probably, as a rule, there were the driver and three combatants, and there were in general two types of tower—one, a light type of wicker or similar work, for field purposes; the other, a high, massive type, such as those apparently employed by Polysperchon for firing into the battlements of Megalapolis. From these towers a continuous fire of arrows, stones, and javelins was kept up on the enemy as the elephants advanced. According to some writers, elephants were even trained to pick up individual opponents, and pass them up to the tower to be dealt with! In addition, everything possible was done to arm the elephants themselves. Their faces and ears were painted white, blue or red, to make them more fearful; points of steel, swords, poisoned daggers, etc., were added to their tusks, which were usually protected by iron plates; swords or small scythes were fastened to their trunks; spikes and long lances were fixed sticking out from their breasts and bellies; and, finally, before going into battle, they were often given their "tot of rum," *i.e.*, intoxicating drinks, or heating drugs. One can fully realise

that even Alexander admitted, when he first saw them, that he had not before met in any combat a danger so worthy of his courage ; or that Plutarch wrote that they were "an overwhelming torrent which nothing could resist."

In addition to all this, elephants were favoured by nature ; their odour and their trumpeting are apparently naturally terrifying to horses, and it is only with the greatest difficulty that the latter can be trained to face them.

OFFENSIVE TACTICS.

From the armament of the animals, one can see generally how it was proposed to employ them. They were to be used to terrify their opponents, men and horses, to break the ranks of their infantry formations, to get inside these formations, and to be of the greatest value in pursuit. It took each leader, however, a considerable time before he evolved any definite tactical policy for their employment, and no one leader seems to have learned much from the mistakes or successes of any other. The history of elephant tactics in the offensive is very similar to that of tanks up to the battle of Cambrai. In fact, the most striking feature in the study of the offensive tactics of this ancient tank is the complete lack of any continuous policy in their use. This was probably due to the difficulty of the dissemination of news or accounts of battles. They had none of those Heaven-inspired newspaper war correspondents to give the world their garbled versions of encounters, to point out to the experienced commanders of the day their mistakes, or to show the world at large how easy it is to find short cuts to victory.

In order to obtain an idea of the offensive tactics of elephants it is proposed to look at a few typical battles in chronological order, and to study in outline the elephant encounters. It has already been stated that the European use of elephants dated from Alexander's encounter with Porus at the Hydaspes in 327 B.C. Here Porus had probably 100 to 150 elephants, and he was on the other side of the river to Alexander, watching the enemy to prevent his crossing. He employed his elephants in two main ways—firstly as a cavalry outpost on the river to watch, and to strike at once at any force that succeeded in crossing ; secondly, to accompany his main battle forces to attack Alexander if he should succeed in crossing elsewhere. After Alexander had succeeded in his crossing, both armies were drawn up in array to fight a pitched battle, and Porus made the mistake of the early tank battles. He made no use of the mobility of his elephants. They were placed in small packets at about 100 yards interval in between the infantry, who were ordered to keep very close to them. Really they were being employed as a form of heavily armed infantry, and on the defensive. They could not use their mobility or charging powers, they were cramped by the restricted space allotted to them, and they simply became mixed up in the general mêlée of the battle, with the result that they refused to remain in their restricted areas, turned on their own infantry, and broke Porus' ranks.

Alexander at once saw the value of this new weapon of war, and began to collect elephants for himself, but unfortunately he did not live sufficiently long to show whether he was evolving any sound method of employing them. His successors used them more and more, but the period of squabbling among Alexander's generals after his death was not favourable to any clear tactical policy, and the only real result was the deterioration of the infantry.

The next interesting battle was that of the Gabienus, where may be found the first example of elephant versus elephant. It was fought between Antigonus and Eumenes, two of Alexander's generals, who were contending for the supremacy after Alexander's death. There is an added interest to this battle, as it also affords an excellent example of the attempted co-operation between elephants and cavalry. Eumenes had 125 elephants, Antigonus 65. The former drew up his forces in a convex order, with the convexity towards the enemy, placing 40 elephants in front of his right flank, 40 in his centre, and 45 on his left. He considered that this convex formation afforded the best chance of co-operation between all his arms. In the intervals between the elephants, he placed light, mobile archers and slingers. The battle began by Antigonus attacking and attempting to outflank Eumenes' left flank. The latter brought up some reserve cavalry, and by this means, and by his archers and slingers, held up his adversary's elephants and attacking troops; then Eumenes at once put in a strong counter-attack of elephants and cavalry. The elephants charged, breaking up the enemy's formations, and the fresh cavalry swept in behind these "tanks" to destroy the disorganised bodies opposing them and to take up the pursuit. "But what was most pleasant," wrote Polybius, "was to see the elephants themselves crash against each other, and fight each other furiously. The following is the way these animals fight each other: With their tusks, and without moving their positions, they push against each other with all their might, until the stronger of the two turns his antagonist's head, and as soon as the latter exposes his flank, it is pierced by the elephant's tusks, like bulls pierce with their horns." There was another similar counter-attack by elephants and cavalry made against Antigonus at the battle of Ipsus, 301 B.C., on the River Halys.

In spite of the difficulties of the dissemination of information lessons were being learned from these various experiences, and a gradual improvement in tactics can be observed. In 275 B.C., Antiochus Soter made very skilful use of the elephants at his disposal against the Galatians. He had only sixteen, so he decided to keep them in reserve, for the decisive blow. He therefore hid them carefully in rear, and awaited the attack of the enemy. When this had been launched, and the enemy was completely involved, he suddenly initiated a counter-attack with his elephants. The surprise of time, tactics, and weapon was complete, and the Galatians were almost entirely destroyed.

It was left to the Carthaginians under the foreigner, Xanthippus, to produce at the battle of Tunis, in B.C. 256, the elephant battle of Cambrai. Xanthippus had watched successive Carthaginian disasters against Regulus, and he declared that they were due to the bad generalship of the Carthaginian leaders. They had fought over ground where they could get little results from their elephants. The first essential, he maintained, was to find ground suitable to the operations of this arm. He so impressed the Carthaginians that he was given command over their forces, and he proceeded to put his precepts into practice. Instead of operating in hilly or broken country he moved down to the plains by Tunis, and forced Regulus and the Romans to meet him there. He had some 100 elephants, and his method of attack was to range these animals sufficiently far ahead of his phalanx to allow them to break the enemy's legions before the phalanx arrived in contact with the latter; this method also gave sufficient room for the elephants to rally without interfering with the phalanx, in the event of their being repulsed. In order to stop the obvious intention of Xanthippus, Regulus drew up his legions in much greater depth than usual, realising that the first necessity for defence against this arm was depth. All went as Xanthippus prophesied. The elephants charged ahead, and broke large gaps in the lines of the legions. The phalanx followed behind, entered the gaps made by the elephants, and soon completely broke up the legions, which were still being crushed down by the elephants. Directly he saw that his attack was being successful, Xanthippus launched his cavalry at the flanks of the Roman forces, and their doom was sealed. Unable to resist, they were either massacred or fled, pursued by the cavalry and the elephants, which Xanthippus had rallied for the purpose. The Roman army was almost completely destroyed, and the Carthaginians lost but 800.

This battle seems to show the highest level reached in the offensive tactics of elephants. Armies became more and more accustomed to them; it was realised that they could not win battles by themselves, and whereas, as will be seen, anti-elephant measures and weapons were continually improving, little could be done to improve their offensive powers.

The Romans fought long against employing them, but, though they succumbed to their use in the end, they were also responsible for showing that they could be rendered useless in war in Europe. Cæsar sounded their death knell at the battle of Thapsus in 47 B.C., when his corps d'élite of ten cohorts completely repulsed and drove back on their own ranks the elephants of Juba and Scipio, although these animals seem to have been almost completely armoured. So far as Europe and the greater part of Asia Minor are concerned, then, the military era of elephants began with Alexander and ended with Cæsar.

In the history of offensive tactics of elephants, there are one or two minor points of interest. Firstly their use in sieges, where they were

employed as mobile towers, with large wooden structures on their backs from which sufficient command could be obtained to fire on the battlements of the defence, as was done at the siege of Megalapolis by Polysperchon in 318 B.C.; secondly, their use in the crossing of rivers. Polybius gives an extremely interesting account of Hannibal's method of getting his elephants across the Rhone, whilst history relates that Cæsar succeeded in forcing the Thames by means of one elephant. The line of the river was being held by Cassivelaunus with infantry, cavalry and chariots, when Cæsar brought up a single elephant (history does not relate how he got this to the country) with a tower containing slingers and archers. Directly this monster began to cross the river, the enemy became terror-stricken and fled.

DEFENSIVE METHODS AGAINST ELEPHANTS.

The analogy between the evolution of the tactics of the employment of elephants and that of tanks is much closer in the case of defence than in that of attack. From the point of view of the defence, the elephant was an almost exact counterpart of the tank, whereas from that of the attack, the elephants differed most unfavourably by being a living being, with the temper and behaviour of such.

The evolution of anti-elephant defensive methods follows exactly that of anti-tank, and can be best shown under the following headings :-

- (a) Moral.
- (b) Weapons.
- (c) Ground.
- (d) Tactics.

(a) *Moral.* Whenever elephants appeared against troops who had no experience of them, they were immediately successful. Unfortunately, as has already been pointed out, both man and animals were completely overcome with terror at their appearance, and it was the first task of commanders of the day to attempt to make all ranks and animals of his command so accustomed to this new weapon that they would stand their ground if attacked by them. The difficulty in many cases was that the commander had no means of obtaining any elephants with which to train his command. Extraordinary steps were taken to overcome this difficulty at times. Perseus, King of the Macedonians, had some made of wood with men inside them to move them and to blow trumpets. The fabled Semiramis, long before, so it is said, had gone even further: she is stated to have killed 300,000 black oxen, and to have had their skins sewn up in a shape as nearly that of an elephant as possible. These skins were then half-filled with straw, and inside were placed a camel to act as the means of locomotion, a driver to drive the camel, and another to blow a trumpet! The Romans finally succeeded in their object after they had captured some of Pyrrhus' elephants, which were sent round all their camps; but the difficulty of moral, and especially

of accustoming horses to the elephant, always remained very great. It is of interest to note the similar situation in the Great War. To raise the moral of their soldiers with regard to tanks, the Germans took a photograph of one of the British tanks which had been knocked out and set on fire, showing half-burned corpses inside, and this photograph was issued broadcast through the army. It is stated that it worked only too well, and that when they tried to man their own tanks, they could not get a single recruit.

It is of interest, also, to note that it was apparently discovered that elephants in their turn were terrified by the noise of pigs, and, after suffering disaster because his elephants fled in terror from pigs which the enemy produced, Antipater ordered then that pigs were always to be taken with his elephants to accustom them to the sounds. Similarly, bands or loud noises often frightened them, and when an elephant attack was imminent, the enemy usually blew trumpets, shouted, and banged upon their shields.

(b) *Anti-elephant weapons.*—This was the next most important factor, and, as to-day, it developed along several different lines :—

- (i) The reproduction of a very mobile chariot armed with scythes, etc., the use of which, without stretching the imagination unduly, one might liken to that of the aeroplane against the tank.
 - (ii) The production of the field " balista," or anti-tank 18-pounder to attack the elephant.
 - (iii) The production of light anti-elephant weapons in the hands of the infantry.
 - (iv) The production of anti-elephant mines.
- (i) The production of the chariot was rather interesting. In the Carthaginian armies, they abandoned the chariot almost entirely in favour of the elephant ; in the Roman armies, they reintroduced the chariot as eminently suitable for an anti-tank weapon because of its mobility. On the whole, it was not satisfactory, owing to the difficulty in getting horses to face the elephants.
 - (ii) The field " balista," or " carrobalista," also was not very successful ; it was really not sufficiently accurate against a moving target, and could not be switched with sufficient rapidity, a fault similar to that in the 18-pounder.
 - (iii) It was the production of light anti-tank weapons for the infantry that proved the real downfall of the elephant, and there appears, even in those days, to have been the controversy as to who should control these weapons, and as to whether they should belong to the infantry or be grouped and controlled by others. At any rate, it was undoubtedly

these infantry weapons which once more completed the turn of the wheel, and brought the defence up to the level of the attack.

The best forms of these light anti-elephant weapons had an inflammatory composition as their basis, as it was found that flames terrified the animals more easily than anything else. Torches, tarred tow, oil, sulphur balls—all were employed at times. The two most efficient weapons, however, were those known as the "malleolus" and the "falarica," of which full details are available.

The "malleolus" was a large arrow, with a species of elliptical cage made of iron bands in the middle of the shaft. Inside the cage was placed tow soaked in sulphur and bitumen. This composition was lit, and then the arrow was fired by a bow in the usual way.

The "falarica" was considerably larger, and was fired usually from a machine, though there was a small type fired from a bow. It was a form of large javelin, with incendiary material the whole length of the shaft. Livy describes it as follows: "the shaft, of pine wood, which was of circular section throughout, except at the end where there was an iron point, was covered with tarred tow. The iron spike was three feet long, and could thus pierce both armour and body. But, even if it only pierced the shield, without reaching the body, it spread fear, because this javelin was only thrown when alight, and the motion through the air alone made the flames so keen that the soldier was forced to throw away his arms, and was thus left exposed to any further blows without any means of defence."

The usual method of dealing with elephants, then, was to keep up at all possible ranges an incessant attack with slings, darts, arrows, and inflammatory weapons against the animals, the drivers, and the combatants in the towers, and, for close quarters, to arm the infantry with torches and special swords for cutting the elephants' trunks or hamstringing them.

- (iv) Side by side with the production of these weapons went the idea of anti-elephant mines, the use of which is best illustrated during the siege of Megalapolis; but previous to this, anti-elephant traps of large holes covered with thin boards with earth over them had been employed, and deep entrenchments had been dug to deny avenues of approach.

In 318 B.C. Polysperchon was besieging Megalapolis: he had breached the walls, and made an attack, but it

had failed, and he then determined to employ his elephants. Damis, in the town, realised what he would probably do, and had a very careful reconnaissance made of the area over which Polysperchon would have to advance. He then ordered doors to be collected from the town, and for large nails and spikes to be driven through them. These he buried hidden in the ground along all the avenues of approach open to the elephants, and sited them so that they could be covered by the fire of men and machines specially placed on the battlements. He then ordered that his troops were to take up a line in front of these mines, were to pretend to fly in terror from the enemy's elephants, and thus to lead them on to the anti-elephant mines. The scheme met with complete success. The elephants charged straight on to the mines, were largely put out of action or turned against their own troops, while finally a continuous fire was poured on to them, when they had become immobilised, from the specially placed troops on the battlements.

(c) *Use of Ground.*—This was the next method employed in anti-elephant defence, and its importance was very early realised. Elephants could only manœuvre in the plains or in unbroken ground. If, therefore, an enemy in possession of these animals could be made to fight away from the plains, any superiority he possessed by means of that arm would disappear. As will be seen later, the Romans quickly learned this lesson from Pyrrhus, and the doctrine of infantry holding "anti-elephant islands" appeared sooner after the first Roman encounter with the contemporary tank than it did with us. At the siege of Panormus, B.C. 251, there was a particularly interesting example of the use of anti-elephant islands. Metellus was besieged in the town by Hasdrubal. He placed archers, slingers, and engines on all the walls, with orders to concentrate their fire on the elephants. Then he created artificial anti-elephant islands by means of all sorts of obstacles. In front of these he placed his infantry, and these troops were ordered that, if they should be attacked by infantry, they were to hold their ground, but if by elephants, they were to withdraw immediately to the anti-elephant islands, and then emerge again, either when the elephants had been dealt with by the fire of the men on the battlements, or when they could strike the opposing infantry. In addition, on the flank of these islands, he placed in ambush an infantry corps d'élite. Hasdrubal attacked with his elephants, supported by his phalanx, and fell completely into the trap. His elephants tried to get into the islands, were immobilised, and were shot down by an enemy they could not reach; the phalanx was thereby broken up and disorganised, especially as their own elephants turned against them; and then the corps d'élite emerged from its ambush and struck the disorganised force in the flank.

(d) *Tactics of Defence.*—The general basis of the successful Roman tactics against elephants can be summed up as follows:—flexibility of formation, use of ground, use of anti-tank weapons, and the use of a special reserve. These are shown quite clearly in the campaign against Pyrrhus, which it is proposed to examine later. The only additional remark to be made here is concerning flexibility of formation. The Romans made but little alteration in their normal formations, as the legion already provided one much more flexible than the phalanx, with which other nations had tried to meet the elephant. They used the mobility of the "velites," or light troops, to harry the animals with arrows, stones, and javelins in the early stages of the combat; they interspersed their light anti-elephant weapons in their infantry, so that at almost every point there were combined means of dealing with the menace (*i.e.*, the platoon anti-tank weapon); and they adopted a more open formation in the legion, which provided lanes down which the elephants would naturally advance without seriously damaging the formation. Finally, as was seen at Beneventum, they realised the importance of keeping a special anti-elephant reserve, placed in an anti-elephant island.

To get the truest picture of the exact analogy between the history of the tactics of the elephant and the tank, it is proposed to give an outline of the Roman campaign against Pyrrhus from 280 B.C. onwards.

THE ROMAN CAMPAIGN AGAINST PYRRHUS, 280 B.C.

Consternation reigned at Rome. Roman ambassadors had been insulted, and insulted by mere Greeks in Italy itself; but behind Tarentum was an alliance of many Greeks, with Pyrrhus, the King of Epirus, at its head, and Pyrrhus was a man to be feared, even by Romans. He was universally accepted as the most advanced leader of the times; he was the first to use wooden and lead blocks as soldiers with which to study tactics, and presumably to play the war games of the period; and he was the first to employ the elephant against the Romans. He landed with elephants in Italy about 280 B.C., and the ensuing campaigns give a complete representation of the evolution of modern anti-tank tactics.

Ignorant of the presence of this new arm, the Romans gaily marched against him and encountered him at Heraclea; but, fortunately for them, the battle of Tunis, the elephant equivalent of the battle of Cambrai, had not yet been fought, and Pyrrhus had gained from his study of wood and lead soldiers little idea of the correct use of his powerful arm. It was only after the battle had been raging for a long time with indecisive results and with terrible losses, that he then suddenly produced them. Their effect was overwhelming. Men and horses fled in terror from these monsters of destruction, and the Roman Army dissolved.

In one blow, disaster seemed to have fallen on Roman arms. The moral of their soldiers was severely shaken, as their arms seemed of little avail against these new engines of war; their organisation and tactics seemed entirely unsuited to deal with them; and their prestige had been seriously lowered. However, the War Office and the Aldershot Command of the day had some of these strange people—men with advanced ideas—who, in conjunction with the military intelligentsia of the period, set out to find methods of combating this novel menace. Firstly, it was imperative to raise the moral, and an intensive campaign was initiated throughout the country, and the army, to explain how vulnerable really were these animals to men who firmly held their ground.¹ Then the “brain-wave” arrived, and one can imagine the discussions and criticisms that resulted on the issue of the new order. The elephant was to be defeated by the use of the “anti-elephant islands.” In future, ground for combat was to be chosen solely with this in view, the infantry being placed in broken, hilly, woody, or marshy spots, and never to close with the enemy in the open plain. At the same time, another committee was presumably looking into the question of anti-elephant weapons. The chariot with long scythes and spikes was re-introduced as the main defence; but it was realised that it was essential to give the infantry themselves a weapon upon which they could rely for their own defence, and various forms of incendiary arms were issued to them. With these it was guaranteed that they could frighten off their awe-inspiring enemy.

Armed with these new weapons and methods, a year after Heraclea, the Romans again encountered Pyrrhus, and attempted to put their new training into practise. They met at Asculum, and the result was officially a very costly drawn battle. The real victory, however, lay with the Romans. Their new methods of occupying anti-elephant islands, and their new anti-elephant weapons, had repulsed these animals, and the moral ascendancy of their soldiers over them had been almost ensured; but no decision had been gained.

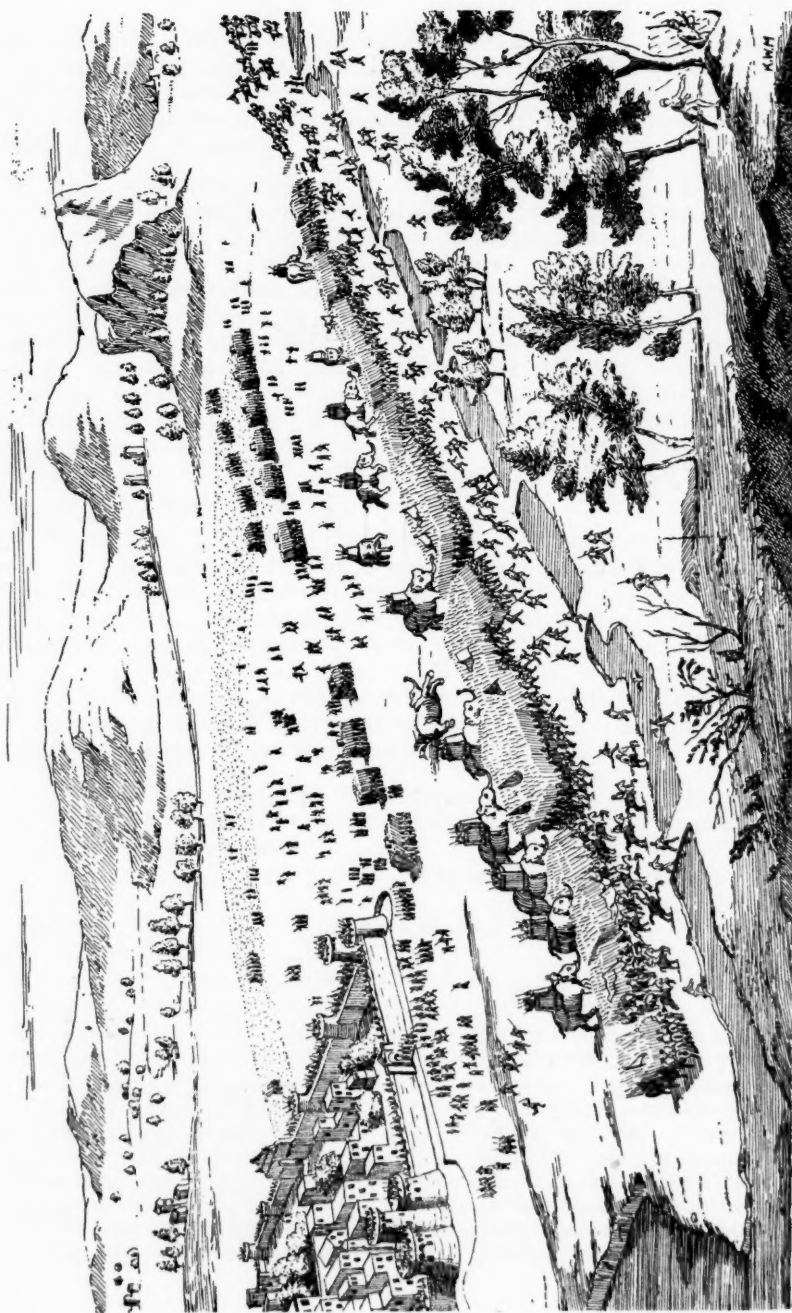
Once again the brains of the army set to work to solve the problem. This time the task was rather easier, as they had captured some of Pyrrhus' elephants, and these were sent all round the army to accustom all men and horses to their appearance. People were encouraged to take every form of liberty with them, and lectures were given to point

¹It is very interesting to compare this situation with that of the Germans in the last war. On the 26th September, 1918, the 7th German Cavalry Division issued an order which began as follows:—

“1.—General.

“The infantry must not let itself be frightened by Tanks. The fighting capacity of the Tank is small, owing to the bad visibility, and the shooting of the machine guns and guns is cramped and inaccurate as the result of the motion.

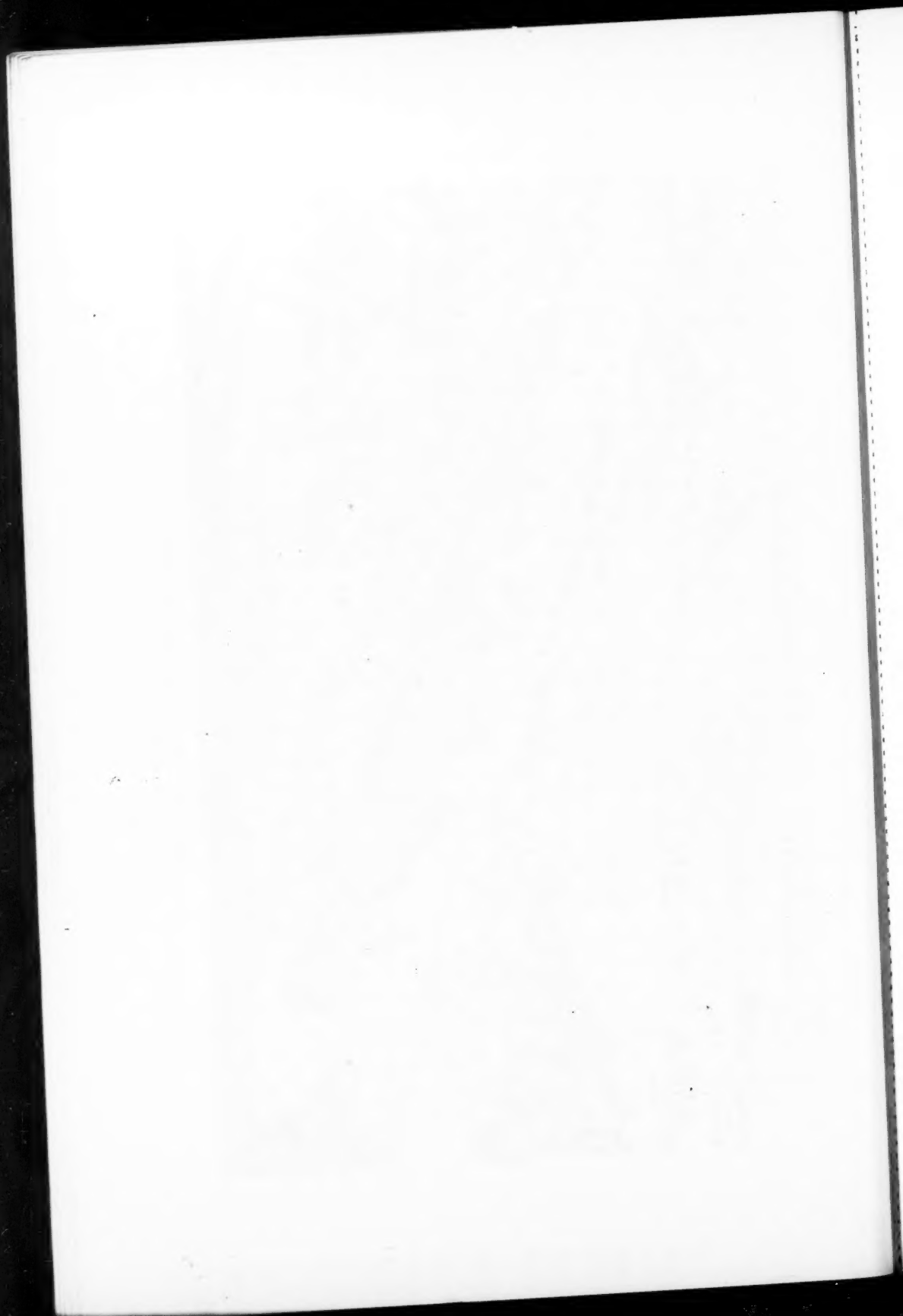
“It has been proved that the Tank crews are nervous and are inclined to turn back, or leave the Tank, even in the case of limited fire effects. . . .”



THE TANK. "FULL CIRCLE GOES THE WHEEL."

La Bataille de Palerme, 251 B.C.

Copied from an old French engraving by Captain H. W. Merryloes, R.E.



out the most vulnerable portions of their anatomy.¹ Anti-elephant weapons were further increased, and it was then decided that there was another final essential for dealing with the problem—the retention of a reserve in hand specially for counter-attacking elephants, and thereby gaining a real decision.

At Beneventum, they put all their ideas to the test. They took up the usual position in anti-elephant islands, and Curius kept a specially constituted reserve in hand. Pyrrhus attacked on one wing with his elephants, drove in Curius' line, and pursued it. From his anti-elephant island, Curius then brought into action his special reserve. The elephants were rather disorganised by their pursuit, and they were met from the island by a bombardment of arrows, javelins, and stones; then the reserve infantry advanced against them with a flaming torch in one hand and sword in the other. This was too much for the animals, and in fear and fury they turned and trampled upon their own forces. Curius was watching for this, and at once despatched the rest of his reserve—a striking force of cavalry—against Pyrrhus' open flank, and the battle was decisively won.

In the short period from Heraclea to Beneventum there came about a complete phase of the everlasting struggle between attack and defence. "Accablés d'abord," wrote a French historian of the Romans at Heraclea, "par une attaque dont ils ne connaissaient point la portée, ils comprirent bientôt que leur manière de combattre n'était point à la hauteur de ce nouvel instrument de destruction: ils sentirent la nécessité de lui opposer d'autres armes et une nouvelle tactique: et le succès couronna si bien leurs efforts qu'ils finirent par enchaîner and par trainer au Capitole ces terribles animaux, qui leur avaient causé tant de terreur."

Take heed, you present descendants of the ancient living tank, that you be not destined to grace the triumph of some future leader, for "full circle goes the wheel!"

¹The Germans did exactly the same in the last war. "In the autumn of 1917," writes Williams Ellis, in "The Tank Corps," "it will be remembered that the Germans had captured a number of our Mark IV machines. These they used for the purposes of propaganda, parading them in the streets of Berlin and showing them to the Army, as a man might demonstrate the harmless nature of snakes by the aid of a tame cobra. The infantry were lectured to about the miseries endured by the crews who manned Tanks, as to their mechanical defects, their vulnerability and general worthlessness."

CERTAIN ASPECTS OF AIR DEFENCE.

By GROUP-CAPTAIN W. F. MACNEECE, C.B.E., D.S.O., D.F.C., R.A.F.

On Wednesday, 4th November, 1925, at 3 p.m.

AIR VICE-MARSHAL H. R. M. BROOKE-POPHAM, C.B., C.M.G., D.S.O.,
A.F.C. (Commanding R.A.F. Staff College) in the Chair.

THE CHAIRMAN: Our lecturer this afternoon, Group-Captain MacNeece, is a well-known personality in the Air Force. He started flying as far back as 1913 and served with the Air Services during the war in France; he then went out to Iraq, where he was for some two years Chief Staff Officer. You will see therefore that he brings a varied experience to bear on a subject of which he has made a special study, and I am sure you will agree with me that the sooner he gives us the benefit of that study and experience, the better.

LECTURE.

WHEN I first was honoured by the invitation to give a lecture at the R.U.S.I., it was suggested that the title of the lecture might suitably be "General Principles of Air Defence." I had not been working at the subject long before I realised—and, indeed, it should have been apparent to me at the very outset—that the title was a too ambitious one.

The air as a military weapon is still in its infancy, and we know that there may be vast changes and developments impending. The data of past experiences is very limited, and to a certain extent conflicting, and if there are, as there must be, a number of principles which can be legitimately evolved and deduced, this is not the place, nor am I the person to enunciate them. You will observe that the title has accordingly been changed from the "General Principles" to "Certain Aspects," and it is a few of these aspects to which, necessarily briefly and incompletely, I would draw your attention.

I propose to divide this lecture roughly into three parts. The first will be to give a few general points which may be of special interest to you. The second, certain details as to the actual forces and composition and development of the Air Defence Scheme (and you will realise that for professional reasons these details must necessarily be of only a general nature) and thirdly, any conclusions or deductions which may appear appropriate.

The very term "air defence" necessarily calls up the idea of invasion. Almost certainly there is no nation in the world which is so ill-equipped mentally to face squarely the issues of invasion. If there is anything in heredity, and who can doubt it, then there must have been bred in us, steadily and in increasing measure, through many generations, this sentiment of immunity from external attack which even in Shakespeare's days was a national boast.

"This England never did, nor never shall,
Lie at the proud foot of a conqueror."

Forgive me if at the very outset I seem to be digressing aimlessly, but I can promise you that if it is a digression at all, it is entirely intentional. I think that the apathy and absence of real appreciation of the issues of air invasion are due more than we realise to this almost unconscious mental heritage of freedom from external invasion. It needs a few sledge-hammer facts before we can break down our old conceptions and substitute new ones. The most that can be said at the present moment is that there is a tendency to talk glibly of the Air Force having become the first line of defence without any very clear realisation of what is implied.

I think as the peaceful years go on the futility of this attitude of putting new wine into old bottles will become increasingly clear. If the years are peaceful the change may well be a gradual revolution in outlook and in organisation (just the same process as will be the social revolution which the milder of our political extremists promise us), but, if the years are not peaceful the revelation of the changed form of warfare will come as a flash, and we should do what we can in these relatively early days to ensure that it does not come as a devastating flash so far as this country is concerned.

THE NEW PERIL.

I suppose that almost the earliest reverence which was implanted in every decent English boy in the countless years before the war was the reverence for the achievements, the invulnerability, the might, majesty, dominion and power of our Navy. It was entwined inextricably in every sentiment of patriotism. The lore and language of the sea permeated into districts far removed from it. It became part of our everyday speech. We talk about "plain sailing," "sailing near the wind," "taken aback," "till all's blue," and a hundred other phrases which are so much part of our everyday speech as almost to conceal their nautical origin.

It comes as a shock to us to realize that the sea in a few years (in the twinkling of an eye, as we view the history of nations) has changed from our sure defence and bulwark to conceivably our greatest enemy. The sea in the future cannot save us from invasion, in certain circumstances it might conceivably starve us. And in making a statement like this, I do hope that it is unnecessary to say that there is not camou-

flagged in it a single vestige of a criticism of the Senior Service whose vital functions with regard to the safeguarding of our food and commerce remain unchanged.

If the fundamental conception of the sea with regard to England has been changed, it has been due to an elemental fact like the conquest of the air, and to that alone.

And now let us very briefly consider the idea of invasion with respect to the land. It is, of course, not true to say that the possibility of invasion has always been considered entirely remote by statesmen and leaders in the past. The Martello towers round our coast are witnesses to the contrary, and even in the Great War through which we have passed, it is common knowledge that the most minute and elaborate schemes were prepared to meet invasion; but I think it is safe to say as regards the latter case, that these preparations were made with an idea of meeting an unlikely possibility rather than a probability, still less a certainty. The picture for the future is a very different one. The invasion which we must accustom ourselves to regard as a certainty, in the event of war with any Continental nation with a large air fleet, is very different from the Napoleonic bogey where the manhood of the nation fighting on its own soil might be trusted to give a good account of itself against a few thousand enemy who had managed to elude the vigilance of the Navy.

The invasion which will be a daily, and probably a nightly occurrence for certainly a few days, in the event of future wars, will be a drastic visitation of which the worst of the air raids during the last war must necessarily have been but the veriest foretaste.

And now, having accustomed ourselves to the idea that any great continental war in the future will entail invasion as opposed to the relative immunity of the past, we should do well to consider one or two of the salient and peculiar features of air invasion—and here again we have a complete breaking with the lessons of the past. Experience has shown that no matter how perfect the mobilisation arrangements of armies may be, the first few days after the outbreak of war have nearly always been marked by hostilities on a relatively minor scale. The reason is obvious. Vast concentrations of men on the actual frontier would be regarded as a provocative act, and consequently there has always been a certain lull before hostilities on the grand scale have commenced. With air action it is otherwise. The pilots are ready, so are the machines. It takes but the pressing of a button, so to speak, and the first and greatest raid of the war will be under way.

The other salient difference is even more obvious. The land forces of a country, and the naval forces and the air forces have all got one common end in view, but they achieve that end in different ways. The end in view is to supply the necessary means by which their Government can impose its will on that of the enemy, but the main objectives are different. The main objective of the Army is necessarily to defeat

the army of the opposing nation. The objective of the Navy is a similar one, in addition to safeguarding our vital lines of communication. The objective of the Air Force is to paralyse in every way possible the enemy's power and will to war. This is not the place for a strategical discussion, but it must be realised that the main objective of an air force in war will not be solely or even primarily to search out the enemy aircraft with a view to destroying it. Such a procedure may be inevitable, and may be possible, but so far as the future of air warfare can be foreseen it is anticipated that the main air effort will be against those centres of vital importance on which the enemy depends to carry on war—and that conclusion takes us one step, a very tragic and disastrous step, further.

These main centres of communication, the actual seat of Government, the great railway stations, will nearly all be found adjacent to and in great cities. The bombing aircraft of the enemy will be attacked by every means possible by defending aircraft and by anti-aircraft shells. It is only too obvious that the bombs dropped legitimately enough on warlike objectives will be so widely dispersed as to be a continuous menace to the whole population. This brings me to the second salient difference in air invasion.

War in the past, if one excepts the great barbaric wars of antiquity, has been, to a certain limited extent, some respecter of persons. Steadily, in recent centuries, it has had a tendency to involve more and more in its grasp. One reads in the past of armies doing battle by the simple spectacular and economical method of choosing a champion of each side, and on his individual prowess the issue of the day depended, and then for many years right from the middle ages to the Peninsular Campaign, we have the example of comparatively small armies waging long and bitter wars without any overwhelming effect on the general life of the nations involved. The last war brought numbers directly and indirectly into the conflict on a scale for which there was no precedent and it is much to be feared that the development of air warfare will give irresistible momentum to the tendency which we have traced.

It cannot be foreseen that anybody will be exempt, women or children, aged statesmen or active indispensables. In the universal realisation of this fact, perhaps, lies the greatest assurance of peace in the future. At this stage I must conclude the first part of this lecture.

An effort has been made to show the absolute necessity for regarding invasion as an integral part of any great continental war in future, and also to point out that air invasion differs from land attack in that it may be expected to reach its maximum intensity at the very outbreak of war, and also that it threatens to involve the whole nation, irrespective of sex, age or employment. But I feel that before going into any brief detail as to the actual preparations of the Air Defence Scheme, it is essential that you should be convinced both of the danger and the necessity. I feel that I cannot end this part of the lecture better than

by quoting the dictum of the one soldier of our day who, from his professional attainments, both in the field and academically, and also from the unique position which has enabled him to gain the broadest grasp of the aspects of modern war, is perhaps the most supremely fit of all to express a definite opinion. It is hardly necessary to say that Marshal Foch, the recent Generalissimo of the British and French Armies is referred to, and his statement on the subject has so often already been repeated as to be almost a classic, and has never been seriously controverted :—

“ The potentialities of aircraft attack on a large scale are almost incalculable, but it is clear that such attack, owing to its crushing moral effect on a nation, may impress public opinion to the point of disarming the Government, and thus become decisive.”

THE AIR DEFENCE SCHEME.

In considering the actual Scheme of Air Defence I am sure you will understand and appreciate the reasons which compel any lecturer to be most guarded in imparting any information which may be considered as of a secret nature, and I need hardly ask you to make full allowances for the difficulty in which I find myself in this respect. I feel that we will have to delve back a little bit into the past in order to gain a proper perspective of this Scheme of Air Defence.

At the end of the war we had no fewer than 200 service squadrons abroad. We had an equivalent of 199 squadrons at home for training and reserve purposes.

Within two years of the Armistice we had fallen to our low water point. We had then only 28 squadrons. Of these 28 squadrons absurd though it may seem, only one squadron was available for Home Defence.

8 squadrons were in India, 7 were in Egypt, 3 in Mesopotamia, and 5 serving at home and abroad with the Navy. Of the 5 remaining, 2 were Army co-operation squadrons, one was on the Rhine, one was for communication, leaving the magnificent total of one for Air Defence.

We are not concerned with the political action taken as the result of this state of affairs. It is sufficient to say that it was first agreed that the Home Defence allotment should be raised to 15 squadrons, and that subsequently it was fully realised by the Government of the day that this allotment was entirely inadequate, and that it was then raised to the present figure of 52 squadrons.

In framing the Home Defence Scheme, the Air Ministry decided to submit a programme which would fulfil the following three principles :—

- (a) The forces to be provided should be sufficiently strong to afford adequate protection against the largest air force within striking distance of our shores.

- (b) The Defence Forces should be so organised as to admit of any subsequent expansion found necessary.
- (c) In order to combine a reasonable standard of efficiency with a maximum of economy, and at the same time to facilitate the process of expansion, it was decided to frame a certain number of Special Reserve and Auxiliary Squadrons.

The following are some of the points which it is legitimate to mention with regard to the 52 squadrons which have been allotted for Home Defence:—The process of expansion is in full swing at the present moment. It will be obvious to you that these 52 squadrons will be of different types.

First there are those squadrons which are earmarked for purely defensive purposes, *i.e.*, for attacking the enemy aircraft on their raids to London and other objectives. The other portion of the force will be offensive squadrons which will be directed to seek out those of the enemy objectives, the destruction of which will most paralyse him in the conduct of the war.

Let me deal first with the first type, *i.e.*, with the fighter aeroplanes which are used for defensive purposes. These will, normally, consist of small single-seater machines with a very high performance, *i.e.*, with great speed, a good ceiling and absolute power of manoeuvre, all of which are essential if they are to be in a position of superiority when attacking the enemy bombing machines.

While it is not desirable to give the exact number of defensive squadrons or their exact location, it is, however, permissible to say that they will, in general, occupy a zone some thirty miles from the southern and eastern coasts. And straight away I would like to anticipate an obvious criticism of this location. It is obviously not an ideal location—an ideal location would be on the coast line, so that the enemy could be engaged before ever they came to England.

Perhaps a very simple military analogy will serve best to explain the reasons which, for the present, at any rate, have necessitated a location somewhat in rear. It is no use your taking up a military position which provides you with a magnificent field of fire which is in itself almost impregnable, and which combines every other military advantage, except that the enemy need not encounter it in order to attain their objective. In other words, no position is any good which does not enable the Army, or the Air Force alike, to fulfil its *raison d'être*. The *raison d'être* of the fighter squadrons, put as briefly as it can be, is to engage, and as far as possible, to defeat the enemy bombers before they reach their objective.

What is the height at which the enemy bombers will come? What is their objective? What is the period of warning which we may reasonably expect? What is our rate of climb? We may expect the enemy to come over at any height up to 25,000 feet. We must count

on London, with its limitless targets, as being probably the main objective. We cannot, in the present state of the science of detection of enemy aircraft, count on more than thirty to forty minutes' warning.

The last thing that you will want is that this lecture should degenerate into a mere elementary mathematical problem, but I think that the figures which I have just given you will show you that the necessity for locating fighter squadrons well back from the coast is one which is forced on us by facts which are incontrovertible at the present stage of aircraft development.

I do not want for one moment to mislead you into the idea that all the fighter squadrons will be in this belt some thirty miles from the coast. There will be others, and they will be well thrown forward. It is to be hoped that by their specialised training they will be able to carry out the most valuable duties. They may be able to break up and defeat, or at least delay the enemy bombing formations. They should in any case be able to give very early and reliable information to the main defences in rear, and they should be in a supremely suitable position to inflict very heavy casualties on the enemy bombing formations on their return from their objectives.

Needless to say, it is most fully recognised that the offensive handling of our defensive measures is in the highest degree essential, and every scientific development which will permit of the air battle being joined as early as possible will be most fully exploited.

I have mentioned this detail of air defence at some length because it emphasises a most important general lesson. The development of aircraft precludes a scheme which is definite and fixed, and the necessary embryonic stage of development of air tactics and strategy precludes anything in the nature of watertight and doctrinaire theories.

BOMBING SQUADRONS.

I mentioned earlier that the two main divisions of the squadrons employed on this scheme for the protection of Great Britain were fighter squadrons and bombing squadrons. Again, it is not permissible to give the exact number of squadrons which are earmarked for the bombing purpose, but it is safe to say that the number of bombing squadrons is very considerably in excess of the fighter squadrons, and here again I would like to meet quite frankly two points which will doubtless appear to you as obscure.

These bombing squadrons will be grouped into three main divisions, both for convenience in strategical and tactical handling and for administrative purposes. These three groups will be described as East Anglian, Wessex and Oxford Areas. Again you may say—surely it would be better to have these bombing squadrons on the coast in order that they should be as near their objective as possible.

It may be of some interest to you to realise briefly the reasons which have prevailed in the selection of these areas.

The first consideration must, of course, be the technical or topographical one. In other words, it is quite useless to select an area which is strategically ideal as being close to the enemy objective and which is tactically satisfactory as being difficult for the enemy to locate and consequently to bomb, but which fails to fulfil the primary and essential condition from the flying point of view of supplying good aerodromes suitable for large aeroplanes to land by day and night.

From the above, you will observe that there are three main considerations which may be borne in mind. The various aerodromes must be topographically suitable, they must be strategically suitable, and tactically they must not be unduly exposed.

It is, of course, impossible for me to discuss in any detail the reasons which have prevailed in the choice of any specific areas. It is, however, safe to say that the importance attached to the rôle of these bombing aircraft in the early stages of a war is so great as to necessitate every reasonable endeavour being made to save them from being too much exposed to enemy attack.

But I mentioned that there would be another point on which you would doubtless require information. It is in reality a much more important point. It reaches far down to all basic considerations of the future of air warfare. Put briefly, it is—"why should it be necessary to earmark in a scheme which is essentially defensive, the greater proportion of your forces for offensive measures?" In other words; "why should not all the squadrons be earmarked for that rôle of defence which, after all, most faithfully reflects the peaceful aspirations of the nation at large?"

I will not for one moment attempt to deny the attractiveness of this point of view. If only the alternative which it provides was remotely practicable, any other course of action would be indefensible. The pity of it is that it is entirely impracticable. It is unfortunately, only too easy to show wherein this impracticability lies.

The whole difficulty turns and hinges on this question of a third dimension. The third dimension is nowadays such a common phrase that it is almost in danger of becoming hackneyed and thereby losing its significance. Perhaps another way of describing it may be more convincing. The battle zone of the air may be imagined to stretch up to any height, say 30,000 feet, and it may be divided up arbitrarily into any number of smaller zones, say 500 feet in depth. There you will have sixty separate zones. It may not do to press the parallel too closely, but it does serve to bring home in a very trenchant way the enormous and almost incomprehensible basic difference between manœuvres in the air and on the ground.

But if the problem of locating and engaging the enemy aircraft could simply be reduced to making allowances for the third dimension and the speed of the aeroplanes involved it would be comparatively simple compared with the actual position. When one realises the cloudy

weather and the partial mists which prevail in this country for the majority of the days of the year, together with the certainty of many of the enemy attacks being launched at night, it will become apparent that the endeavour definitely to locate and engage enemy bombing attacks is one of the most extreme delicacy.

We may confidently hope that our fighter squadrons will be so trained and that scientific appliances will be so improved as to increase materially the chances of this contact being obtained. But the fact remains that, humanly speaking, it is impossible to deny that on a considerable number of occasions, when the climatic conditions are really favourable to concealed advance, the enemy bombers will occasionally be able to elude the vigilance of the defenders.

I mention this point not with any idea of striking a note of pessimism—in fact, quite the contrary. It is merely to emphasise that air warfare is like all other forms of warfare in that it confers an enormous advantage to the offensive. The future of air strategy is, admittedly, undecided, but it is safe to make one statement without any fear of future contradiction, and that is that any scheme of air defence which provided the main for the defensive action as opposed to offensive action would be absolutely foredoomed to failure.

GROUND DEFENCES.

Up to the present point in this lecture I have only dealt with the broad Air divisions of this scheme of Home Defence—but any lecture would be obviously inadequate which did not refer to the part played by the Ground Organization.

The Ground Organization may perhaps be divided into four categories :—

- (a) Anti-aircraft provided by the Royal Artillery.
- (b) Searchlights provided by the Royal Engineers.
- (c) Acoustic and scientific developments generally provided by military and civilian experts.
- (d) The Observation system for transmission of information.

Time will only permit me to deal very briefly with these subdivisions, and there are naturally many who by virtue of their specialised training could do so more thoroughly than I can hope to do.

The functions of the Anti-aircraft Ground Defences are direct and indirect. They hope and expect to take a toll by direct hits on bombing aircraft, but in addition, they are of very great value in forcing the bombing aircraft to fly at a greater altitude, in generally disturbing the accuracy of their bombing, and also in indicating by their shell bursts potential targets for our single-seaters.

I have mentioned quite frankly the difficulty of the fighter squadrons in locating the enemy bombers, and the main basic difficulty which concerns the anti-aircraft gunner is even more obvious.

Under existing circumstances, it takes some thirty seconds for a shell to reach 20,000 feet. This does not sound enormous, but when you consider that the target at which it may be aimed travels at perhaps 120 miles an hour, it becomes obvious that it will have moved a mile during the period of the flight of the shell.

The sighting apparatus which enables the necessary calculation to be made automatically and almost instantaneously is an ingenious one, and the recent experiments made by the anti-aircraft units in firing at a mobile target suspended from an aeroplane have been most interesting—but when you consider the often indifferent visibility, the enormous height, the high speed, and the small superficial vulnerable area of the target (some two square yards) you will realise some of the difficulties which confront the direction of anything approaching accurate anti-aircraft fire.

The rôle of the searchlights, put very briefly, is to discover and to illuminate the attacking bombers and expose them as targets both to the anti-aircraft guns and our own aircraft. They are absolutely essential to any scheme of defence in which air attack by night must be reckoned on.

There is little doubt that searchlights have made and will continue to make, great strides in the picking up of enemy aircraft, but here again, it is useless to deny that they are up against one of the great factors which makes the work of single-seater fighters so amazingly difficult, and that is the foggy and cloudy weather which is all too prevalent. A comparatively thin bank of cloud entirely blankets the searchlights, with the result that they are unable to carry out their primary function.

With regard to (c) and (d), the acoustic and scientific developments generally, and the system for centralising and collating information with the very shortest delay, it is impossible for me to go into in any detail. The results obtained are of a most interesting and secret nature. The developments of air tactics and air strategy may largely be affected by them.

CONCLUSION.

And now in conclusion I would beg your permission to end this lecture on another note, and to emphasise two final points.

An effort has been made to show honestly and without exaggeration the difficulties, many of which we hope to overcome, of air defence in its strictly literal meaning—and of the absolute necessity of having earmarked a strong offensive contingent. But this is not all. No matter what are the defensive arrangements, there can never be a question of a guarantee of immunity from air attack.

In future wars, one side or the other will have superiority in the air—it must be our object to win it. But there will not be anything so definite as a supremacy of the air—the proud title which we have been accustomed to apply to the sea. What follows, and what is the

result? It follows that victory will come to the nation which in an air war in the future has not only the strongest striking force, but which shows the greatest stoicism and ingenuity in meeting strange and devastating terrors.

And last of all, in this Institute, of all places, where cluster thick the banners and the trophies and the memories of every part of the Empire in every age, it is perhaps just and appropriate to emphasise that a real Scheme of Air Defence is not a mere selfish national consideration, but is, in fact, the strongest link in the great and delicate chain of Empire.

We stand at the parting of the ways, between the wars of the past—and the wars, if they come at all, of the future. And the main difference is this :—

In the wars of the past the outposts have died in order to give the nation time to repair the deficiencies of peace—in the wars of the future, a blow from the air will fall on the heart of the Empire, and we must see to it that the outposts do not die for a second time because the heart of the Empire is dead.

DISCUSSION.

EDUCATION OF THE PEOPLE.

AIR COMMODORE C. L. N. NEWALL, R.A.F. : The lecturer has, I think, made quite clear to us two things ; one is that in a future war it will be everybody in the nation who is affected, and secondly, he says that the victory will accrue to the nation which shows the greatest ingenuity and stoicism. Possibly it is within his power to tell us whether anything has been done to educate people who do not have the advantage we have in the Services of coming into contact with these matters.

REPLACEMENT OF LOSSES.

LIEUT.-COLONEL F. A. G. NOEL : The lecture is a very interesting one, and must have impressed all greatly with the possibilities of future attack from the air. I should like to know whether the lecturer can give any further information on the subject of the continuity of defences after the first few weeks of the attack which he has foretold. It appears to me that our defence force in the future will be almost comparable with our Air Force in France in the year 1917. To maintain an Air Force in France then, under war conditions, we had the factories of our country and of some of our Colonies, and the help of Foreign Powers to enable us to make up for our war losses. It would be very interesting to know in what way we are to meet these material war losses, which are far greater in the air than any other Service ; because it is the only arm in which the " main armament " is expendable. I should like to have some further information on that subject.

The lecturer remarked on the danger in connection with the sea. I take it he means a narrow sea? This island to-day is only geographically an island—from a military point of view it has ceased to be an island—whereas Japan, or any island 100 or 200 miles from the coast, is an island in the full sense of the word. I think that is a point of very great importance to us. One cannot help feeling

that in using the word "defence" as applied to an island so close to a continent as we are, we should consider that the only true definition of the word should mean the possible military control of a continental area, sufficient to form a theoretical coast line at the required distance from our shores, and that nothing less will ever replace the safety hitherto given to this country by the Navy.

UNDERGROUND AERODROMES.

LIEUT.-COLONEL M. B. SAVAGE: I should like to ask the lecturer if he can give me a little information in connection with aerodromes. What strikes me is that in the next war that takes place the enemy will at once seek out and destroy all the aerodromes in this country. In the last war the infantry soldier went underground. Has anything been done to build aerodromes underground, where the aeroplanes could go to for repairs if they were damaged, or where they could remain for safety in case of a large bombing attack taking place?

LECTURER'S REPLY.

GROUP-CAPTAIN W. F. MACNEECE, in reply, said: I will try to answer as well as I can the questions that have been put to me.

The point raised by Air Commodore Newall as to the measures which are to be taken to educate people and the precautions taken on their behalf, and how to get them to a proper spirit for facing this menace, is one, I think, of major policy. I think that educating the nation at large in what is certainly in front of them, and the arrangements which will be made to safeguard them, are matters of absolute Government responsibility, presumably belonging to the Home Office, and are matters which far transcend anything that comes within the scope of a Service department. No officer in the Air Force—except that he is in the position to give a certain amount of technical advice to the Government—is more responsible than officers in other Services for the educating of the public at large. That limitation of responsibility has been recognised.

In regard to the point made by Colonel Noel, I confess I did not quite understand the issues raised about the sea, or about placing an island further away from the main land. When I spoke about the sea possibly having become our worst enemy I was referring to the narrow sea as we know it, and not to the open sea.

With regard to the continuity of defence, that brings one up against a side which has constantly to be considered in all Home Defence problems. We know that very heavy casualties must be expected and that the strain on our replacements will be enormous. On the other hand, we know that the taxpayers' patience at present is very limited.

The point that Colonel Savage brings up is exactly the same. There are many things which are ideal for an air defence scheme. Nothing would be better, if technically possible, than to have aerodromes bomb-proof, but I think it is necessary to realise that nobody is going to make serious efforts at making any structure bomb-proof against the largest bombs of the future. There have been bombs of 4,000 lbs. dropped in America, and a bomb holds far more explosive than a shell of the same size, because the actual container itself is quite thin. It is humanly impossible, to get any buildings proof against such bombs, and I am afraid we shall have to give up the idea of having aerodromes underground so spacious that big machines can come and go from them and which are yet bomb-proof; it is a sort of Utopian dream of an airman.

THE CHAIRMAN: I have often thought it is a great mistake for a Chairman to spoil a good lecture by volunteering remarks of his own, but I think that Group-Captain MacNeece's lecture has been so excellent that it will stand one or two remarks from me without being ruined. There is just one matter amongst many others that has struck me particularly, and that is where the author said we were coming to the parting of the ways; the parting of the ways, not only as regards material things, but also as regards our attitude of mind.

One so often finds in studying history that a parting of the ways comes when some new factor is introduced which people had not foreseen, and then comes the moment of vast changes in war. Take the Roman Legions. They thought themselves invincible, but then there came a time when they had to face light and well armed cavalry, and they disappeared. They had forgotten about mobility, whereas someone else had not. Then take the chivalry of France, which were wiped out at Crecy and in other battles. They had forgotten about missiles, the long bow, and so forth. Then there was the Swiss Infantry, supreme in Europe in the 15th century. They thought themselves supreme, paid no attention to the world's progress and neglected to consider the introduction of gunpowder, with fatal results to themselves.

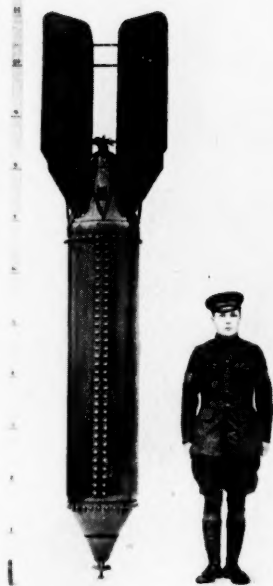
Those were comparatively minor innovations, but now we have come up against something much bigger. As the lecturer said: 'are not we now at the parting of the ways, and faced with an enormous change?' It is our attitude of mind that is so difficult to adapt to great changes. We are so apt to go on thinking like the Swiss infantry and the French chivalry and the Roman Legion, that things will go on in the next war as they did in the past. We have to see that we do not continue to think in terms of the past and so get wiped out in our turn. Considering that man has been accustomed to think and move in two dimensions for countless generations, it is not surprising that we find difficulty in changing our attitude of mind and in thinking in three. I am sure the nation as a whole finds it difficult. We in the Air Force do.

We often hear people say, "I could no more do that than fly," and that shows we are not thinking in three dimensions. The biggest effort we have to make is to attune our minds to thinking on these new lines and trying to see what it all means. People are not doing so at present, and that is the biggest effort we have all to make, not only in the Air Force but in the nation as a whole. The lecturer has given us a very clear lead.

I will now ask you to pass a very hearty vote of thanks to the lecturer. I am sure we are all extremely grateful to Group-Captain MacNeece.

The vote was carried by acclamation.

ADMIRAL SIR H. H. BRUCE, K.C.B., M.V.O., thanked the Chairman for presiding.



A 1650 LB. BOMB.

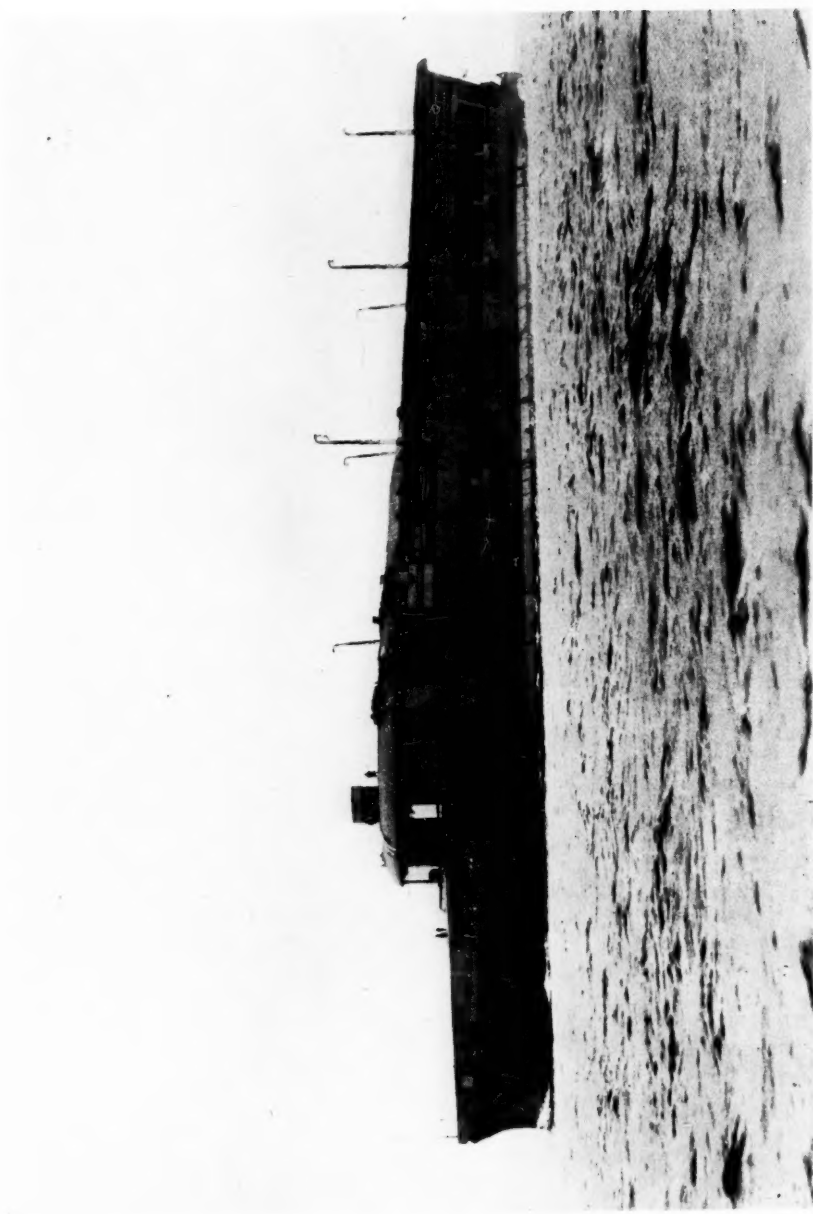


THE EXPLOSION.



THE RESULT.

CERTAIN ASPECTS OF AIR ATTACK.



From a Photograph by Stephen Cribb, Soudkca.

THE LATEST ADDITION TO THE FLEET AIR ARM.

H.M. Aircraft-Carrier "Furious."

Re-commissioned after Re-construction 1st September, 1925.

IN A GERMAN AIRSHIP OVER ENGLAND.

A STORY OF THE RAID OF 19th-20th OCTOBER, 1917.

Note.—On the night of 19th-20th October, 1917, it will be remembered, eleven German airships attempted a serious bombing attack on the industrial centres of the English Midlands—London was not the objective. Owing to lack of meteorological data no warning was received of the heavy northerly gale which set in above 14,000 feet on that afternoon. The velocity of this fierce air-current at one time exceeded 70 f.s.

Caught in this storm the German airships were swept southwards and, in struggling to get home, found themselves over France. Five were lost—L.49 landed in Eastern France and surrendered; L.50 made an emergency landing near L.49, tearing away the forward car, from which all but four of the crew landed, and then rebounded and was driven South and finally lost in the Mediterranean; L.44 was shot down and burnt at St. Clement; L.55 was wrecked in the Thuringen Forest after reaching Germany; L.45, the subject of this narrative, landed in Provence.

The following account has come to hand from a foreign source. It is that of one of the helmsmen of L.45. The man's story has been translated and checked by two of the actual officers who were working on this subject during the Great War: the facts may, therefore, be assumed to be substantially correct.—Ed.

"YOU ask me whether I do not regret my life and my work in the German Naval Airship Squadron. Well! I can only reply that, since the war came to an end, I have never felt the slightest desire to go up in the air, either in an airship or in an aeroplane! I served for over two years with our airships and, while the war lasted, there was no man in our Service more zealous or more willing to make a war flight than myself. But on thinking it over during the past years I know and feel that I have had enough of the air. The risks we ran were never properly appreciated in our own country. The thanks we received were small enough. We were ever abused for not doing our share against England. The earlier stories of huge damage that our raids on England were believed to have accomplished, all these were swallowed by the German public, until it would have been impossible for our commanders to return without tales of having repeated such exploits. Yet those of us who steered the airships over England had had every opportunity of judging how uncertain were our commanders as to their courses and the effect of our bombs. Many a time I had heard them—the commander himself and his watch officer or his warrant officer—wondering were they over England! As I was at the wheel I knew as well as they did of their uncertainty! There was only one airship commander with whom I ever flew that I would have trusted to find his way over England without making a bad mistake. That was Heinrich Mathy. What a man he was! And his crew—the best that ever mounted into an

airship. But even Mathy sailed over England chiefly in 1915, when navigation was easier and the enemy aeroplanes were hardly in existence! It was indeed luck that in 1916 I twice sailed with him as second steersman when that ordinary member of his crew was on leave. When Mathy was brought down at London¹ the greatest gloom overcame the Airship Service. It was in fact the end of our great hopes that we should force the English to make peace by bombing London with the new big airships that were first built in 1916. Mathy was given the command of the first of these (L.31). What a wonder he was! He laughed at the greatly improved English gunfire and his crew would tell how he would slow down his ship and deride the English gunners to hit him as he flew over London. It was a wonderful tale that his crew would bring back.²

It was the aeroplane firing the incendiary bullet that brought about his downfall and with him the life and soul of our airship service went out too. We still flew; our ships were mostly quite well commanded, but it was never the same again! I for one was lucky, for I found myself at the end of 1916 allotted to the crew of one Waldemarkölle, a brave commander, and a pleasant gentleman to deal with though a hard man and harsh in manners. But to compare even him with Mathy; no, that would be doing an injustice to the best and most skilful officer our service ever possessed—or could wish to possess.

After Mathy's death we never did so much raiding as of old. It was thought, first of all, that we must improve our airships. The new ships of 1916 had been defeated, not by the guns—we used to laugh at them—but by our own gas. The terrible hydrogen! Had it not been for the gas, Mathy would not have died! How many ships did we not lose through the gas? I myself in my service have counted three airships alight, and I know that more than twice that number have been destroyed by the fire of their own gas over our own country alone. They used to try and hide it from us, but how could they? These things did not happen unseen, and, we of the airship service, we always knew where our comrades were and how they fared.

So it came about that because the gas was still there and still inflammable as ever, they tried to make the airships even lighter and lighter, so as to go so high as to be unseen and unattainable by that invention of the devil, the incendiary bullet. Had we caught the man who invented that bullet during the war we should gladly have burnt him on the great flying ground at Ahlborn³ in a stream of blazing

¹Mathy was commanding L.31 when that ship was brought down by Lieut. Tempest, R.F.C., near Potters Bar on 1st October, 1916.

²There is reason to accept the statement that Mathy once (September 1915) stopped his ship over London, and once (1916), drifted over London on a strong southerly breeze with his engines shut off.

³The principal airship station of Germany in 1917.

hydrogen. How many of my friends have not perished through his infernal invention?

In 1917 some beautiful new airships were completed at Friedrichshafen. They were indeed marvellous! We, that is Kölle and his crew, were allotted to L.45, a great change after our old wooden-framed Schütte-Lanz. We, who had known the ships of 1915 and of 1916, were astounded at the new ship. Everything was so perfectly contrived to save weight, while the ship itself was even bigger, even though it had grown lighter and so rose higher. The cars were smaller, it is true; we were more crowded; our rest quarters had been suppressed; machine guns had gone so as to reduce all weight. Height and speed, we were told, would be our true defence. Six thousand metres¹ would be easily attained and no English gun or aeroplane, it was stated by our officers, could touch us at that height. Alas! our hopes were not to be fulfilled so literally as that. It is true that the guns seemed powerless and the searchlights were no longer so much to be feared, for the new ships were painted black underneath. They became virtually invisible from the ground about 6,000 metres.²

During 1917 several improvements were carried out on the new ships: they were to be made even lighter before embarking on a new series of raids against England as the weather improved. The cars were made still smaller. The wing propellers were done away with, until we could hardly recognise our engine cars.

It was assuredly not all pleasure to serve the engines in so crowded a space. The ladders leading into the wing cars were fearful things to ascend or descend in a gale and during frost. Still we put up with these discomforts for we thought that we should now be safe, so the engineers, huddled close to their engines, and went on contentedly in that belief. But we steersmen, who could see and could hear our officers and warrant officers, soon began to have some doubts. Navigation, too, grew more difficult at such heights.

What, however, brought consternation to some of us was the effect of the height; and not only the actual height but also of the rate of ascent. It was soon found during the actual height trials of the new ships that the strain exerted by their terrific ascending power was greater than many of us could stand. Height-sickness, nausea, giddiness, we nearly all suffered from it or them, in some form or another. The older men felt it more than the other younger ones. One comrade of mine—not in my own ship fortunately—died from heart failure during his first height trial and the ship had to come down. I myself, and many others, soon grew accustomed to the changes of altitude, but the process of climbing often left me somewhat slow of hearing and my work grew heavy as the navigator who had to share my duty at the wheel did not

¹About 20,000 feet.

²Perhaps not absolutely true; this depends on the power of the light.

take to the new ship at all well. So I often did more than my own turn for I felt sorry for the poor fellow; he had always been kind to me and he was grateful, too, for my lightening his task.

Then there was another trial—the cold! That was far worse than the height in its effects. The engine ratings were not so badly off; they at any rate could feel the warmth of the engine while we, poor devils, in the forward car, with at first no means of heating ourselves, suffered terribly. It was all very well for the short trips, that lasted only two or three, or even six hours at a high altitude. That was play compared to the long flights that now fell to our lot. Cold and height went together—often even in the summer nights when these were short and the days had been hot. But in the autumn things were to grow worse. By a stroke of devilish mischance our new ship, L.48, somehow or another never returned from a raid over England during that summer and we never found out what had happened to her. It was a great blow to our officers, that loss! It was worse still, as the commander of the Western Naval Airships, Kapitän Viktor Schütze, was on board. Now, he was a bold, skilful officer and we knew full well that he would never have flown low or shirked the cold. It was said, with truth, I believe, that he had purposely flown on that English raid in order to test the capacity of the new ships. But it was also rumoured, whether true or not I cannot say, that he had also gone on that ship as her commander had been suspected of the worst crime that a German Naval officer could commit—not carrying out his orders for reasons of fear. It was the English aeroplanes.¹

Anyhow, this disaster had grave consequences—at least so we all decided later. Our new airships were no longer trusted as they had been before; our commanders were undoubtedly shaken in their belief in the possibility of escaping the aeroplanes by means of the climbing powers of their craft. So they sought to go still higher up and we suffered still more from height and yet still more from the cold as the summer days grew shorter.

Well, so it was more and more evident to some of us that things were ripening for trouble. Engine breakdowns grew more frequent as the cold grew more bitter. A few of our best and oldest warrant officers were asking to go back to fleet work or anything to escape the trials of these flights under the new conditions. For a raid on England was becoming a serious undertaking. In former days December flying over the North Sea with Mathy at 600 metres (2,000 feet) on a warm night, with resting quarters available in the ship; this could be no great hardship. But now our commanders would start at 3,000 metres (10,000 feet) as soon as they were clear of land. Then, as soon as England was made, they would go 4,000 or 5,000 metres (13,000 to 17,000 feet), with

¹L.48 was brought down by British aeroplanes at Theberton in Suffolk on 17th June. Two of her engines went out of action and she had become virtually unmanageable at the time.

the expectation of climbing to even greater heights if attacked by aeroplanes aided by searchlights from the ground. Twenty hours of this ordeal would bring me home exhausted, deaf and sometimes giddy. For two days afterwards I was good for nothing, and our seaplane pilots at Borkum would laugh at us—that hurt! For those fine gentlemen did not know what it means to do twenty hours at those heights, at night and in that cold. What did they know about it, they who could remain out for less than six hours and that too at never more than 3,000 metres.¹

Our commander, Kölle, however, was not to be deterred. He weeded the weaklings out of his crew and he still further tried to lighten his ship by leaving out our relief numbers. On one occasion he flew his ship to England with only 14 men besides himself. This nearly brought him to disaster. One engineer went sick, neglected his engine, which soon froze and we came home—by a mere fluke so I shall always think. Had it been really cold we should have come utterly to grief. The matter came to light and Kölle “got a black cigar”² from the commander of the airships at Nordholz. Orders were also issued by him that no car was to be manned by less than one rating during any height trial or any war flight. Kölle grumbled, it is true, but he was a bit scared by his own temerity and he was not bold enough to attempt it again.

It was under these conditions that in the middle of October preparations were begun for what was to be a big raid on England. We all knew there was something coming off, although we were not told. The ship was overhauled and filled. Kölle had shipped but a light load of bombs; he left one steersman and the relief telegraphist behind. His face showed that he meant business. We looked anxiously at the clouds and wind, for we fully realised that we would fly high and long. That meant cold! Kölle's own hip pocket was bulging with a packet of food and we had all done the same.

On the 19th October the final orders came and we left our shed³ at half-past eleven. The journey over the sea was cold and misty. We barely sighted some of the other airships off the Frisian coast. There were at least twelve ships under orders to attack England, so I understood Kölle to tell the navigator, and from the radios that were taken on board I think they all must have started. We did not see them at all clearly, for it was the custom to fly independently while keeping a general direction. Once started the radio gave us little news. Once or twice we thought we saw another ship; L.54 we recognised by the setting of her cars; L.47 we distinguished through the glasses. Then I heard Kölle identify L.50, so it seemed to him, and he passed some

¹10,000 feet—a slight exaggeration.

²A “severe wiggling.”

L.45 was stationed at Tondern in Schleswig.

disparaging remark about her commander for he despised his skill as an airman no less than he suspected his determination. L.49 we thought we recognised, or so the navigator said, by her little flag that she flew from her forward car.¹ But it was a dreary, windy crossing and owing to the cold and height many of us were feeling numbed and slack by the time we made the English coast at about 8 p.m. We could not be sure of our landfall as it was dark and our navigation was undoubtedly at fault. We should, so I believe, have crossed the Lincoln coast; but from an argument we had with the officers our navigating warrant officer, Hashagen, expressed grave doubts as to the landfall. I felt sure we were a long way south of that. Kölle, however, though looking anxious would not give way. I looked at my comrades in the car to see if I could read their thoughts, but only cold and anxiety were there. The wind must have freshened from the north for even then, like the lightning, some searchlights cut the air; all I could see by their warm beams was the leeway that we were making. Kölle swore and jumped at the ballast control cords. The ship rose rapidly. "5,800!"² read Hashagen off the altimeter; the height and the cold made him look ghastly in the pale searchlight beam as he leant on the glass panels. I shall never forget his face. I felt, too, that I would get little sympathy from him, if I dropped out, for the height and anxiety were telling on him already. Guns opened on us too, but that did not trouble us.

For nearly two hours more we struggled to keep our westward course but the wind blew ever stronger and I could tell that our navigation was getting more and more uncertain. We dropped a few bombs at some faint lights but providence alone knows where they went. I scarcely believe that Lieutenant Schütz, our second-in-command, even troubled to set the bombing sight.

By this time it was bitterly cold. Hashagen once read the thermometer aloud and gave over 30 degrees of frost.³ I heard him mention Birmingham as our target but he did not believe we had reached that locality. We climbed still higher as the weight of the bombs and petrol grew smaller and it grew still colder. Hahndorf, an engineer, now came in to report to Kölle that the men were feeling the cold. The sailmaker, in particular, who was attending to the valves of the gas bags, complained of his feet. Well he might do so, for he could not wear his felt boots when climbing about the ship. He said he could not go on much

¹This flag was a purple square decorated with the armorial bearings of her Commander Gayers. He used to fly this flag for the benefit of his family, who lived near the coast and could see the airships daily. By means of this flag they could recognise L.49. The flag subsequently captured with L.49 was hung in the office of the French Secretary of Aviation in Paris, where some fanciful stories were wont to be told as to its significance.

²19,000 feet.

³Centigrade—about 60°F.

longer. Two engineers, so Hahndorf said, were sleepy; while the petrol rating was grumbling and fumbling over his work.

Something must be done. The wind was rendering our progress westwards laborious. It was clear to us who had no say in the matter, that we ought to turn back, yet Kölle would not give in. The navigator and director began to express misgivings. Finally, Hahndorf re-appeared and gave it as his opinion that his engineers could not be trusted to go on much longer under such conditions. Reluctantly Kölle gave the order to turn; it was now about 11 o'clock. Hurriedly he gave his instructions for the return overland—over Belgium. This was a bad sign, for it was not a step that our airship commanders would do unless the weather or other conditions were threatening. I could tell by the compass that we were now steering south-eastwards. The wind must have increased in violence and the cold was the worst I have ever experienced; I could scarcely continue, in spite of all felt boots and quilted clothing, it was terrible. It grew too cold to pull out the food to eat; the meat that one man pulled out was hard as stone. Kölle clearly not knowing where he was let out more ballast; we must have touched 6,500 metres or more.¹

At about 11.30 we began to see lights below and as the lights continued so it suddenly dawned upon us that it could only be the city of London that we were crossing in the air. Even Kölle looked amazed at the dim lights as Schütz suddenly shouted "London!" It was then that we first realised the fury of the savage tempest that had been driving us out of our course. But Kölle clearly had but one thought—that was higher. So he released more ballast and the bombs—first two sighting shots and then the rest. Over London! We had achieved what no other German airship had done since Mathy had bombed that proud city over a year ago! And his last trip across the city had proved his undoing.² Fortunately for us we were unseen; not a searchlight was unmasked; not a shot was fired; not an aeroplane was seen. If the gale had driven us out of our course, it had also defeated the flying defences of the city! It was misty or so it seemed, for we were above a thin veil of cloud. The Thames we just dimly saw from the outline of the lights; two great railway stations, I thought I saw, but the speed of the ship running almost before the gale was such that we could not distinguish much. We were half frozen, too, and the excitement was great. It was all over in a flash. The last big bomb was gone and we were once more over the darkness and rushing onwards.

It was then that our misfortunes began. Hahndorf reported to Kölle that the engine of the port wing car was scarcely working—he thought owing to the sooting of the plugs. The plugs were cleaned by

¹21,000 feet or over.

²Mathy never crossed London on this last raid (1st October, 1916); he was brought down before flying over the Metropolis.

the engineers but alas! their hands were so cold and they themselves so clumsy with lassitude and fatigue owing to the height that, by the time the plugs were cleaned and replaced, the engine had ceased to function—the cooling water had frozen; the radiator¹ had split and there was no means in our power to get the engine into action again.

From this moment our journey became one long story of misery and pain. The cold grew intense and we all began to feel dejected at the consciousness that our real attack on England must have failed. The jubilation at having flown over the enemy's capital gave way to anxiety. At the helm of the ship we began to feel that the gale was driving us away, still further out of our course. We were so high that the earth was scarcely visible. Clouds were obviously being driven beneath us until we could not distinguish the sea. It was somewhere after midnight that Hahndorf came to report to the commander that the sail-maker could scarcely go on with his duties; his feet were frostbitten and the poor fellow was now lying in his hammock unable to do more. The petrol rating was complaining of weariness and sickness, leaning up against his tanks. Two engineers were suffering from height: one of these had been relieved by the man from the port wing car. Kölle became visibly perturbed! Even Schütz, usually so cheerful, looked pale and anxious. So we went on in gloomy silence.

For some two or three hours—we hardly knew how the time went by—we drove on, but, as events showed later, our course was now pure guess work. When and where we crossed the sea we could not tell. Hashagen argued we were now steering over Belgium, but somehow his voice lacked conviction. Kölle uttered not a word. We well knew that he was more than uneasy. The want of our port propeller told on the steering and I myself feared that this would endanger our safe return to Germany.

The hours dragged on. The petrol rating was now really ill. Both ratings from the port wing car were now relieving other sufferers. Hahndorf was growing anxious about his fuel supply and said so. Kölle stormed at him. But the man's worn, pale face and his frozen black moustache and beard deserved only pity. He was gallantly struggling against sickness.

At last dawn began to light up the sky. One, and then another, airship were barely distinguished against the eastern light. They could only be German, but we dared not use our radio, and that in itself was proof that we might be over the enemy's air defences. Kölle rapped out a bitter exclamation as this suspicion grew into certainty; flashes on the ground showed hostile gunfire to be at work; whether shooting at us or not we could not tell. We saw no bursts. Still more, to our intense relief, we never sighted an aeroplane! Schütz assumed a reassuring tone, but this was abruptly checked when we felt the forward

¹This was of a new pattern, which could be raised or lowered out of the car by a winch. It was then right down.

engine behind us slowing down and finally stop! Hahndorf came in; he was almost breaking down. The petrol supply for the forward engine had given out and the radiator, as the engine ceased running, had frozen solid.

With this accident our hopes of reaching home decreased greatly. Yet somehow we could not realise it or else Kölle had succeeded in making us believe that things were better than they were. This failure of the engine, directly occasioned by the illness of the petrol rating, was the outcome of a bad leakage in a union of the feed pipe. It had occasioned the entire loss of two tanks of fuel before Hahndorf could discover the mishap. Worse still, the forward engine, actuated the radio dynamo and this was now useless. The telegraphist had only a small accumulator to work with.

We tried to steer eastwards; but, with two engines and two propellers gone, we began to make worse leeway. We could see the land below and it was becoming clear to me at least that this could not be Germany. The north wind was not abating and the struggle to fly eastwards became desperate. The telegraphist soon reported that his apparatus could no longer transmit. In a last attempt to fly eastward, Kölle determined to come down so as to avoid the tearing wind that was driving us more south than was safe for us. But there was little need to come down very far. In spite of the bombs, ballast and fuel that had gone, it seemed to me that we could scarcely have kept our extreme height, for we had lost much gas.

Shortly afterwards another misfortune overtook us: a third engine failed! This time it was in the after car, where the men had been refilling one of the radiators that had all been steaming heavily owing to the height of our flight. The water-inlet cover had been clumsily replaced, the water had been jolted out or steamed away until the engine grew so hot that the exhaust side was red. In vain they struggled to rectify the damage—it was all to no purpose, and the pistons seized before it could be remedied.

It was, if I remember, at this same time while at a height of some 4,000 metres¹ or rather less that we flew over a large town² in the early morning. What it was I do not know. A voice in the car exclaimed "Dijon!" That caused me to think. If that indeed were Dijon then we must fly over Switzerland to reach our own country. We still struggled on, but it was now obvious to me that we should never bring the ship home to our country. Before nine o'clock Hahndorf came to report that the petrol supply was failing and that his men were nearly exhausted.

¹About 13,000 feet.

²This was Lyons.

Kölle turned to his charts once more, but could find none to help him, for they did not extend so far south. So he brought the ship down nearer the ground to look where he might be.

By this time we thought we were over Switzerland and it appeared as if internment in a neutral country would be the only method of putting an end to our sufferings and of avoiding a total wreck of the ship with evil consequences to ourselves. Kölle was doing the right thing, so I felt. Two of the others, as we were coming down, exclaimed "Switzerland! See the snow mountains!" People could now be seen streaming out of their houses to look at the ship, which was now only 1,500 metres up. That fact alone made us feel sure that we had not reached Germany, for at home the population would never be seen rushing out to look at a Zeppelin airship like this. Before we could land we were to have further unpleasant experiences.

Between 8 a.m. and 9 a.m. we sighted a curious little town in a gorge, such as might be expected in central Switzerland. But the country was growing rocky and Kölle turned north again to look for level ground for a landing. The valley here grew broad and level—a good place for an emergency descent and we might still save the ship—who could tell? But we were to have a rude shock. Suddenly we saw a large tract of ground all cultivated with vegetables. On this there were working some gangs of coloured men—so we could see from their heads and bare arms—all dressed in blue.

"Black men! French soldiers!" rang out a cry. Kölle stamped his foot and hurriedly ordered full speed on an eastward course again. But Hahndorf came in and talked rapidly. His men were exhausted; the petrol supply was nearly running out: he could not go on with only two engines out of five and two propellers out of four in action. It was risky and he pointed to the mountains eastwards. A forced landing would be the only means of saving the crew.

Kölle bowed to the inevitable and manoeuvred as though descending at Ahlhorn in Germany itself. He calmly ordered the emergency landing flags to be flown and manoeuvred the valves for the landing. We could not but admire our commander in this moment for his conduct was well worthy of what a German naval officer's should be. But ill-luck was to pursue him to the bitter end. In this mountainous valley¹ where we now found ourselves, the north wind was no longer blowing as it had done high overhead, but sharp little squalls were felt at times. As we were touching the ground, so one of these eddies came swirling across the water to our ship. She heeled over to port and the wing car was torn off as it scraped the ground. Two men from the car jumped clear to land. Then lightened of this weight the whole ship seemed to pivot

¹ This was the valley of the R. Buèche, near Laragne, in the Department of the Hautes Alpes.

on her nose and was again caught by the wind. Swaying and jolting, we were tossed across the stream until the whole craft came hard against the eastern side of the valley where she stuck fast entangled in the bushes and wedged among the stones. It was almost with a sense of gratitude that we clambered or jumped out of the cars. The long ordeal was over, but at what a cost! No sooner were we on the ground than Kölle ordered us to fall into line by the ship. All the ship's charts and papers, all our private papers, he and Schütz collected from us. They were stacked into the forward car. The tools were distributed to us and with them we proceeded to break all the instruments and batter the forward car. Hahndorf drew out the emergency pistol, and fired a blazing charge into the central gas-bags, which were still more than partly inflated. With beating hearts we watched the fire take hold of our fine airship. Some of us who were not too exhausted felt as though our last link with the Fatherland was snapped and that the future mattered nothing. We were brought to our senses as the last few tanks of petrol exploded and we had to run from the blazing gas and spirit. Some were almost too exhausted to move and were helped away to safety. Kölle was splendid in this trying moment. We then gave a last salute to the ship and the ensign as it was vanishing in the flames. But with a hoarse shout as though in pain Kölle made us fall in and marched us up a narrow track out of the valley. The sailmaker had to be carried for his feet were frozen stiff, while two others were almost too ill to walk. So our little party of thirteen struggled on to the neighbouring farm where we found a German sergeant in charge of a party of prisoners! What a strange meeting in the enemy's country. This man called his party to him and they helped us to the farm where we surrendered, weak, exhausted and dejected, but still proud of our ship, our commander, and the great flight that we had just completed. Few men could boast as we might do, that they had accomplished such a journey and thrown bombs at the enemy's great capital! But we were too exhausted to do more or go further.

Shouting brought us to our senses. It was a crowd of French peasants that came to look and jeer at their new prisoners. They had already taken our unfortunate comrades who had jumped from the ship when the squall caught her; one of them was dripping wet—it seemed as if he had been thrown into the water by the cowards of the mob.

So in the end, as prisoners of war, we came to Sintern, for this was the little town that but a few hours before, when in the air, we had taken to be a Swiss town. There we were to spend nearly a year and a half. Among those who greeted us there was the crew of the military Zeppelin Airship LZ. 85, which had been shot down by the English eighteen months before at Salonika. We shortly compared notes with them, but they did not and could not understand what we had achieved. Such were the changes that had come over airship navigation since their day! And then, moreover, the military personnel had never had the

same training as we. They had never flown for hours across the sea; they had never climbed so high into the air; they had never suffered from the cold; so they could not understand what we had undergone. Quickly we began to recover from our nerve-shattering experience, but although we all, even the sailmaker, finally regained our health and our spirits, I do not believe that any of us would willingly have undertaken another such war flight as that which we had achieved with Kapitän Leutnant Waldemar Kölle, in L.45 over the city of London. Now I am too old to begin again, but Germany will, I am certain, at some time in the future, yet produce airships and aeroplanes that may achieve the task which we attempted to complete. We failed on account of the gas and of the weaknesses of our bodies, but German courage and German will to conquer will never be quenched. Deutschland über Alles! is still the call of our race—on land, on the sea, and in the air!"

OIL SUPPLIES IN WAR.

By ADMIRAL SIR E. J. W. SLADE K.C.I.E., K.C.V.O.

On Wednesday, 25th November, 1925 at 3 p.m.

ADMIRAL SIR R. G. O. TUPPER, G.B.E., K.C.B., C.V.O., in the Chair.

THE CHAIRMAN: It is with great regret that I have to tell you that Lord Beatty has sent word that his duties, unfortunately, prevent him from having the pleasure of being present to-day to support Admiral Sir Edmond Slade and to hear his lecture. At short notice I have been called upon to occupy the seats of the mighty. Sir Edmond Slade, in addition to having held very prominent positions in the Fleet and at the Admiralty, was one of the first two Government Directors of the Anglo-Persian Oil Company. He is now Vice-Chairman of that Company. It is a great pleasure to me to introduce Sir Edmond Slade to those of you who have not had the pleasure of meeting him before, and I will now ask him to give his lecture.

LECTURE.

THE question of oil supplies in war cannot be properly considered in all its bearings without first examining the facts connected with oil supplies generally, both in peace and war.

Preparation for war takes place in time of peace and that preparation is most efficient which expands peace organisation with as little friction as possible to meet the requirements of war, i.e., with minimum dislocation of essential services. I shall, therefore, with your permission, have a great deal to say with regard to the supply of oil in peace and shall endeavour to deduce from that how the question should be met in time of war.

There is one thing in the material world to-day which is of equal importance with food to civilised man, and that is fuel. Under modern conditions he cannot prepare his food without fuel, and without fuel he cannot obtain mechanical power on the vast scale which modern civilisation demands.

A nation in these days is absolutely dependent upon the provision of mechanical power for its daily existence, and in our present highly industrialised life there is practically nothing which does not require heat or mechanical power for its development in one form or another, and, in order to obtain this heat or mechanical power an adequate supply of fuel is a necessity. In peace this supply can be assured,—at a price,—but in war, when other motives come into play, abnormal requirements are created whilst each belligerent tries to exploit the difficulties

of the other with regard to supplies and, in particular, endeavours to restrict his enemy's command of fuel.

Great Britain has always had adequate supplies of coal in her mines. We, therefore, as a nation, do not sufficiently appreciate what a shortage of fuel might mean to us. We have, however, only to study the history of coal during the recent war in order to understand what an enormously powerful lever the control of fuel provides and the disastrous consequences that result from the loss of such control and the ensuing shortage.

CONTROL OF FUEL IN WAR.

Our control of coal during the war was equivalent in value to a large addition to our naval forces, because on account of this control we were able to cripple enemy naval activities in distant parts of the world, without the necessity of sending out large reinforcements.

It was also such a forceful argument in our negotiations with neutrals, that we were able to convince them, in many cases against their sympathies, that it was to their interests to detach themselves from the Central Empires and to cease to supply them with the necessities of war. Let me give one example out of many. Sweden was warmly sympathetic to Germany. Trade between Sweden and Germany was considerable and at times during the early part of the war tension was so acute that it seemed almost impossible to prevent Sweden from openly throwing in her lot with Germany. Throughout 1915 and 1916 Sweden continued to draw her supplies of coal largely from Germany, while we reduced our supplies to her, partly from policy and partly from necessity because tonnage was not available to carry coal. Towards the end of 1916 and in the early part of 1917, however, German supplies of coal diminished, notwithstanding extreme efforts on the part of the Germans to maintain them. We, with our control of this fuel, were then in a position,—by the threat of withholding coal from Sweden and by refusing bunkers to Swedish ships except on definite conditions, to constrain the Swedish Government to release a number of British ships which were lying in Swedish waters, and also to conclude trading agreements which placed a definite limit on the amount of their trade with Germany and allowed us to take full advantage of Swedish shipping.

What happened in the case of Sweden happened also, more or less, in the case of other neutrals. We controlled supplies of coal and we refused to sell it, either as bunker coal or for any other purpose, except on our own terms. National life for the neutrals was impossible without fuel and they were forced to accept our conditions, namely, the rationing of their trade in such a way that they had no surplus to pass on to Germany.

In the case of petroleum fuel, Great Britain was not placed so fortunately, being dependent on outside sources of supply. It has been stated, with considerable accuracy, that the "War was won on oil,"

because, as I shall show later oil is an absolute essential of certain vital services, but this was only effected by supreme efforts made to secure and ration supplies, which were entirely dependent for arrival on sea supremacy, and almost entirely on the goodwill (natural or forced) of allies or neutrals.

In this manner,—that is to say, through the control of fuel,—we were able to shorten materially the duration of the war without extending our area of operations and without actual fighting.

It may be said, therefore, that the experience of the late war proved that it is a matter of supreme importance to maintain control of fuel, and in this connection there are only two forms of fuel which need be considered, namely, coal and petroleum.

As regards coal, I may say that we have at present such a plentiful source of supply in the United Kingdom that we cannot imagine any set of circumstances which would give rise to a shortage in war,—except, of course, deliberate restriction of output, which would mean nothing less than treachery on the part of a section of the community. Coal, moreover, can be carried in almost any class of ship and requires no special accommodation for maintenance of stocks.

With the advent of the petroleum era, however, we have lost the bunkering control which we previously held. Petroleum, unlike coal, does not exist in the United Kingdom in sufficient quantities to make us independent of outside supplies, and we must be prepared therefore to make sacrifices and to spend money in order to prevent other Powers securing the control of this fuel to such an extent that in time of war they could force our hands by the threat of cutting off supplies.

There lies a serious risk in the fact that the British public do not realise to the full the probability of a shortage of this fuel, because the average "man in the street" is an unimaginative creature and without practical demonstration he finds it almost impossible to appreciate the consequences of a shortage of petroleum, and he is therefore liable to minimize its probable effects in war, particularly if it is going to cost him money to provide against the possibility of such a shortage.

NATIONAL IMPORTANCE OF PETROLEUM.

I do not think it is generally recognised in this country to what a large extent we are dependent upon regular supplies of oil,—or petroleum, as I would rather call it, for petroleum is the more representative term because there are many kinds of oil but they are all derived from crude petroleum. It may be said in fact, that petroleum is becoming more and more vital to the life of our nation to-day. Up to recent years coal has been of primary importance to us, but during and since the Great War petroleum has outstripped coal for certain vital uses, e.g., the propulsion of our Fleet.

Let us consider, therefore, the conditions in modern warfare which make the control of adequate supplies of petroleum an asset of such high value.

It may be agreed, I think, that in any form of fighting the first essential of success is the maintenance of complete freedom of movement,—and I use this term in its widest meaning,—I imply unrestricted movement of men, aircraft and ships of all classes in any desired direction and to any desired extent,—free power of motion of all classes of machinery,—and free movement of all forms of transport both by land and sea.

It is evident that men and guns, ships and aircraft, even if in overwhelming superiority, are useless, unless they possess the power to move rapidly as the changing conditions of the struggle require. That side which is first constrained to become immobile, whatever its material strength may be, has finally to submit to the will of the enemy.

This axiom was clearly exemplified in the late war. So long as the Central Empires had freedom of movement, in some directions at least, so long the struggle remained undecided, but as soon as they were definitely hemmed in by our blockade and their supplies of fuel and lubricants became limited, their freedom of movement was more and more restricted and the outcome of the struggle resolved itself into a matter of time.

Movement of any kind cannot take place without the expenditure of power, therefore, to obtain freedom of movement we must generate power and to produce power we must have energy and to obtain energy we must consume fuel,—it follows therefore, that freedom of movement is entirely dependent upon constant supplies of fuel and, in the case of petroleum, sufficiency of the special transport (tankers) required for its distribution.

To obtain energy in the case of mechanical power, which now plays so tremendous a part in war, fuel has to be consumed in the form of coal or petroleum.

Let us consider the services which are dependent upon the supply of coal and petroleum for their freedom of movement, and we can then better judge of the importance of maintaining supplies of fuel, and particularly those of petroleum which, as I have already pointed out, has displaced coal in many instances as the fuel required for mechanical power.

Mercantile Shipping.—Here coal still remains the more important fuel. 29 per cent. of the world's tonnage is fitted to burn oil fuel, but a large number of these vessels are so constructed that they can revert to coal and can burn either coal or oil fuel at will as the respective prices suit them.

The number of vessels fitted with internal combustion engines, which are entirely dependent upon petroleum for their fuel, is steadily

increasing, as shown by Lloyd's Register. In 1914 only 47 per cent. of the total gross tonnage registered were motor ships with internal combustion engines, but in July, 1925, the proportion had increased to 4.3 per cent.

WORLD TONNAGE OF SEA GOING VESSELS ON LLOYD'S REGISTER.

Gross Tons.

VESSELS OF 100 TONS GROSS AND UPWARDS.

	Total Tonnage Excluding Sailing Vessels.	Steamers fitted for burning Fuel Oil. Gross Tons.	%	Motorships. Gross Tons.	%	Steamers fitted for burning Coal only. Gross Tons.	%
July 1921..	58,846,325	12,796,635	21.8	1,248,800	2.1	44,801,890	76.1
„ 1922..	61,342,952	14,464,162	23.7	1,542,160	2.3	45,336,630	74.0
„ 1923..	62,335,373	15,792,418	25.4	1,666,385	2.6	44,876,670	72.0
„ 1924..	61,514,140	17,154,072	27.8	1,975,798	3.2	42,384,270	69.0
„ 1925..	62,380,376	17,804,122	28.7	2,714,073	4.3	41,862,181	67.0

Authority—Lloyd's Register of Shipping Report, 1924-25.

The Royal Navy.—Here we find an almost complete transition from the use of coal to that of oil fuel for its more important units.

For destroyers and submarines, petroleum is now essential, for these classes would be entirely immobilized if they were to be deprived of this form of fuel.

The Army is becoming more and more dependent upon petroleum for all traction,—even its horses are now sometimes carried from point to point in motor lorries and the tendency is to introduce motor traction for Artillery as far as possible.

General Sir Edmund Ironside, the Commandant of the Staff College, writes, in his recent book on Tannenberg: "In the next war success will go to that army which possesses the best mechanical and destructive weapons, such as motor vehicles, aircraft, artillery and tractors, and which can make the best use of them, thereby economising its man power." He shows that one factor which contributed very largely to the defeat of the numerically superior Russian forces, was the superior mobility of the Germans. For mobility we are to-day chiefly dependent upon petroleum.

In general conversation and in the Press, the strength of an Army is often reckoned in bayonets and guns, but bayonets and guns are useless without an endless train of motor vehicles stretching for miles to the rear to keep the troops supplied with the thousands of tons of material which they are constantly using up. Without the Supply Train the troops could not fight for a day, and the Supply Train cannot move a yard without petroleum,—therefore, a most important branch of military operations, namely the supply of ammunition, provisions and stores to the troops in the field, is entirely dependent upon the supply of petroleum.

The Royal Air Force.—This Service would be completely paralysed without a constant supply of a petroleum product of great purity and of a particular specification.

Civil Services.—It is obvious that the greater proportion of the ordinary traffic of our country would come to a standstill if we had not command of a large and regular supply of petroleum products. It might be argued that we could then revert to horse traction, but neither horses nor suitable vehicles are in existence in this country in sufficient numbers.

It must also be remembered that lubricating oil is mainly a product of petroleum and that machinery without proper lubrication ceases to function efficiently and eventually becomes useless. The deprivation of proper lubricants during the war was one of the most potent factors that brought about the deterioration of efficiency in the Central Empires,—notwithstanding all their efforts to invent a satisfactory substitute for such lubricants they were unable to do so and even up to the present day no practical substitute has yet been discovered.

I think, therefore, that the foregoing considerations sufficiently demonstrate the vital necessity of maintaining control of large and constant supplies of petroleum.

In order to discover in what way the British Empire may obtain control over a supply which would be sufficient for her needs in peace and for her safety in war, we must now consider :—

- (a) Where petroleum is found in the world, and what countries therefore control the supply.
- (b) What is the present demand for petroleum.
- (c) What is likely to be the demand in the future.

I must of necessity be brief, and can only deal with these important points in general terms, but I hope to be able to bring out the main features in such a way that a comprehensive view of the problem may be obtained.

SOURCES OF PETROLEUM SUPPLIES.

According to the present known distribution of Petroleum, 84 per cent of the world's production comes from the North American continent, and only 16 per cent. from the remainder of the world. The principal producing countries are shown on the attached map.

This very unequal distribution is not so alarming as would appear at first sight, because the greater part of the American production is absorbed on the American continent and is not available for sale in the world's markets, while the greater part of the smaller production in the Eastern Hemisphere is available for sale in countries outside the country of production. But it has to be remembered that, at present, American supplies dominate the market and provide two-thirds of the world's requirements.

OILFIELDS OF
THE WORLD
On Mercator Projection



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There are other producing fields in South America, but these are still in course of being prospected.

The fields in Venezuela and Colombia perhaps appear to be the most likely to prove prolific producers, but it may be found that the larger proportion of their output becomes absorbed in the relatively close and rapidly expanding markets of the United States of America.

The second largest petroleum bearing area is in Asia,—partly in Russia, partly in Persia, and partly in India and Burmah. The full extent of these deposits is not yet known, but it is possible that they extend into Asia Minor and Iraq. In fact, in one corner of Iraq an oil field is now being developed which appears to be promising.

In Africa only small deposits have so far been found, but it is a huge and comparatively little-known continent, and it is possible that petroleum may eventually be discovered there in commercial quantities.

In Australia and New Zealand there are no known deposits of any great importance. Prospecting is proceeding, and optimistic reports are issued from time to time by more or less interested parties, but so far success has been negligible.

In the Dutch East Indies, the Celebes and the Phillipines, there are important fields with good producing wells in Sumatra, Java, Borneo, and some of the smaller Islands, and it is possible, that further deposits may be found, both in these Islands and in New Guinea. In the latter, petroleum is known to exist and drilling is actually being carried out, but it is not yet known whether it is to be found there in commercial quantities.

1924.

PRODUCTION AND EXPORTS.

	<i>Production.</i>		<i>Exports.</i>	
	<i>Thousands of Tons</i>	<i>% of Total</i>	<i>Thousands of Tons</i>	<i>% of Total Production.</i>
United States	95,222	69.0	20,559	21.6
Mexico	20,834	15.1	18,405	88.3
Russia	6,187	4.5	712	11.5
Persia	4,245	3.1	3,248	79.6
Dutch East Indies ..	2,917	2.1	2,180	72.4
Roumania . . .	1,798	1.3	435	18.2
Venezuela	1,418	1.0	1,212	85.5
India and Burmah ..	1,087	.8	73	6.7
Peru	1,042	.8	756	72.5
Remainder of World ..	3,152	2.3	—	—
	<hr/> 137,902	<hr/> 100.0		

1924.

TOTAL EXPORTS AND DESTINATION.

Thousands of Tons.

Country of Origin.

Destination.	U.S.A.	Mexico.	Russia.	Persia.	Dutch E. Indies	Roumania.	Venezuela.	India & Burmah.	Peru.
Total Exports ..	20559	18405	712	3389	2113	435	1212	73	756
% of Total Prod'n	21.6	88.3	11.5	79.6	72.4	18.2	85.5	6.7	72.5
<i>U.K.</i>									
(a) Exports.. ..	2413	1196	386	1439	—	54	218	66	—
(b) % of Total Expts	11.7	6.5	54.2	42.5	—	12.3	18*	90	—
<i>Europe.</i>									
(a) Exports.. ..	3657	907	326	458	151	308	388	7	—
(b) % of Total Expts	17.8	4.9	45.8	13.5	7.2	70.5	32*	10	—
<i>N. America.</i>									
(a) Exports.. ..	2182	12995	—	—	3	—	—	—	325
(b) % of Total Expts	10.6	70.7	—	—	.1	—	—	—	43*
<i>Cent. America and West Indies.</i>									
(a) Exports.. ..	1427	1365	—	—	—	—	206	—	68
(b) % of Total Expts	6.9	7.4	—	—	—	—	17*	—	9*
<i>S. America.</i>									
(a) Exports.. ..	1449	957	—	—	.1	—	—	—	363
(b) % of Total Expts	7.0	5.2	—	—	—	—	—	—	48*
<i>Asia.</i>									
(a) Exports.. ..	1985	—	—	627	785	21	—	—	—
(b) % of Total Expts	9.8	—	—	18.5	37.1	4.8	—	—	—
<i>N. Africa.</i>									
(a) Exports.. ..	120	—	—	10	55	51	—	—	—
(b) % of Total Expts	.5	—	—	.3	2.6	11.7	—	—	—
<i>S. Africa.</i>									
(a) Exports.. ..	125	—	—	38	16	—	—	—	—
(b) % of Total Expts	.6	—	—	1.1	.7	—	—	—	—
<i>Australia and New Zealand.</i>									
(a) Exports.. ..	428	—	—	35	124	—	—	—	—
(b) % of Total Expts	2.1	—	—	1.0	5.9	—	—	—	—
<i>Other Countries.</i>									
(a) Exports.. ..	581	—	—	496	801	—	400	—	—
(b) % of Total Expts	2.8	—	—	14.6	37.8	—	33*	—	—
<i>Bunkers.</i>									
(a) Exports.. ..	6189	985	—	286	180	2	—	—	—
(b) % of Total Expts	30.0	5.3	—	8.5	8.6	.6	—	—	—

* Estimated.

Since the United Kingdom does not produce petroleum, she has to obtain it elsewhere, but, under these circumstances, it is only possible to purchase what the producer is willing to sell after he has satisfied the requirements of his Home market. Economic laws provide for this, as a rule, without the intervention of the State, but, in certain countries, where foreign interests have a large holding in the oil fields, steps are taken to ensure a sufficient supply for all internal requirements before exporting. We are therefore concerned not so much with the total production of any country as with the amount available for sale in outside markets. In Diagram I¹, these data are shown by parallelograms, constructed so that the area is proportional to the total production in each country. The quantity consumed at home and the quantity exported is shown on the same figure. It is therefore possible, without the use of complicated tables, to obtain a good general idea of what is happening in this respect in the petroleum world, and to see from what countries the United Kingdom draws her supplies.

We draw 85 per cent. of our requirements from three countries respectively: namely, the United States, Mexico and Persia.

Taking the United States and Mexico first, we must look upon these two countries as one source of supply, because they are so intimately connected with each other in this respect; the United States taking, yearly, three-quarters of the total Mexican production.

There has recently been published by a Committee of the American Petroleum Institute, an important and authoritative report on American Petroleum Supply and Demand, and it is mainly from this source that I have taken the data for the United States. So much has been said of late years of the approaching depletion of the American oil fields, that it is interesting to see what the foremost authorities in the United States consider to be the facts.

The reserve available in the United States in the present proved oil areas, amount to 740 million tons, approximately, and this amount will only last about eight to nine years at the present rate of consumption, and while using the present means of winning the oil.

When all the petroleum which can be obtained from flowing wells and by pumping has been extracted, the report states that there will still remain in the ground about twenty-six thousand million barrels or three and a half thousand million tons, of which the greater part could be extracted by improved methods.

There is, moreover, every reason to expect that new pools of oil will be found within the enormous area of two and three-quarter million square miles, which is known to be petroliferous. Deeper horizons under existing proved oil sands probably exist,—even in the city of Los Angeles there is sound evidence that petroleum exists in deeper

¹ See facing p. 140.

sands. The final conclusion, therefore, of the report, is that in all probability they "can certainly expect a large supply of petroleum over many years."

There is, however, a danger that American internal consumption may increase at a greater rate than that at which new petroleum is brought in, in which case America might be forced not only to restrict her own exports, but also to restrict the exports of Mexican oil by taking more of that country's exportable surplus.

In Persia we have totally different conditions to those which exist in America. The area controlled by any one Company in America is comparatively small, and prospecting is carried out strenuously by many companies and syndicates without much relation one to the other. We find feverish competition to secure the best part of any fresh pool of oil and, therefore, very often the most efficient method is not employed for getting the best results from the pool.

In Persia, however, in view of the large area controlled by the Anglo-Persian Oil Company, it is possible to proceed with the development of this concession on scientific and economic principles, and to extract the crude oil with the least number of wells necessary to thoroughly drain the deposit.

In Persia, one field is already developed which is capable of giving a steady production of at least 5,000,000 tons of petroleum a year, and exploration work is steadily proceeding which will eventually much increase this amount. There seems to be no reason to suppose that the present prolific field now being worked is the only one in Persia, and it is probable that others equally prolific will be discovered in the course of time, because the geological conditions generally are more or less favourable.

With regard to other producing fields in the Eastern Hemisphere, it is possible that some increase may be found in India, and also, perhaps, in the Dutch East Indies, but it is not likely that this increase will be large.

China is a vast unknown area which has never been properly examined for petroleum. So far as the geology of China is known, there is no reason to suppose that petroleum does not exist, but it has yet to be found.

In the Eastern Russian Field, there are great possibilities, but it is not probable that much will be accomplished here, unless the internal condition of the country generally improves, and should this take place she will absorb the greater part of the available output as she did before the Revolution.

In the European field, although Roumania is now well on the upgrade there is no prospect of any increase in the amount of crude available for outside markets at all commensurate with the increasing demand.

THE DEMAND FOR PETROLEUM PRODUCTS.

As regards the question of the demand for petroleum products, the country in which there is the greatest demand is the continent of North America.

The product for which there has been the greatest increase in demand, generally, is motor spirit, and this demand is chiefly governed by the number of motor vehicles on the road.

In the United States, we find that there is one motor vehicle to every 6.3 persons, and it is estimated that by 1938 the saturation point will be reached when there will be one motor vehicle to every four persons,—or a total of 38,000,000 vehicles.

In the United Kingdom at the present moment we have an average of 1,378,000 motor vehicles or about one motor vehicle to every thirty-two persons, and it may be estimated that by 1930 if the present rate of increase be maintained, we shall have 2,400,000 motor vehicles on the road, or if we take the maximum summer figures 2,700,000, or approximately one vehicle to every seventeen persons to be provided for.

UNITED KINGDOM.

MOTOR VEHICLES.

Licences Current

<i>Year.</i>	<i>Average Number.</i>	<i>Maximum Number in Summer.</i>
1922	865,683	975,973
1923	1,015,750	1,131,565
1924	1,190,981	1,326,348
1925	1,377,800*	1,537,340

Authority—Ministry of Transport Quarterly Returns.

* Estimated.

CONSUMPTION OF PETROLEUM PRODUCTS.

Tons.¹

	1920	1921	1922	1923	1924
Motor Spirit	621,016	855,122	1,076,166	1,166,664	1,523,326
Kerosene	584,722	608,269	674,273	655,865	630,070
Fuel Oil	1,471,424	2,514,937	2,236,591	2,314,989	2,963,043
Gas Oil	227,786	317,595	297,583	262,242	249,268
Lubricating	417,652	202,910	281,058	309,521	383,870
Total	3,322,600	4,498,833	4,565,671	4,709,281	5,749,577

Authority—H.M. Petroleum Department.

¹To convert from tons to Imperial galls.:—

Motor Spirit	1 Ton	= 305 galls.
Kerosene	"	= 275 "
Fuel Oil	"	= 240 "
Gas Oil	"	= 260 "
Lubricating	"	= 250 "

Since kerosene is largely used for certain engines, both stationary and mobile, I have taken the total consumption of benzine and kerosene in the United Kingdom as representing the amount of fuel used for small internal combustion engines. The comparatively small amount of kerosene used as lamp oil is shown by the divergence of the two curves on Diagram II¹,—the trend of the fuel curve being steeper than that of the motor vehicle curve.

Extending the combined benzine and kerosene curve to 1930, we arrive at an estimated consumption in that year of 5,020,000 tons of that fuel.

In order to arrive at the amount of crude necessary to produce this amount of fuel, for small internal combustion engines, we may assume that one ton of crude gives one-third of a ton of combined kerosene and benzine; therefore we shall require fifteen million tons of crude to obtain five million tons of straight run light products, and the residue is fuel oil, gas oil and lubricating oil, to the extent of nine and a quarter million tons.

Our probable requirements of fuel oil, gas oil and lubricating oil are more difficult to estimate, for it is probable that the use of fuel oil under boilers will not extend as rapidly as is often anticipated, if the difference between the respective prices of coal and fuel oil become greater, to the disadvantage of the latter. In fact, it is possible that the use of fuel oil may decrease, except for certain special purposes, and that it will therefore be more widely converted by refinery process (cracking) to lighter products.

On the other hand, however, engineers may design small internal combustion engines capable of running on fuel of a specific gravity between .830 and .880, in which case petrol may once again become a drug on the market.

A curve has been drawn on Diagram II, showing the steady increase of ships using heavy internal combustion engines, such as Diesel and Semi-Diesel. The consumption of fuel oil for these engines may perhaps increase steadily, and the total consumption in 1930 under this head may then be expected to reach approximately 7,000,000 tons.

The situation as regards gas oil is difficult to determine because while it is possible that its use, as such, may die out, there will be an increased demand for the same fraction, as fuel for semi-Diesels on the one hand, and as the raw material for "cracking" on the other.

The curve for lubricating oil has been plotted on the same Diagram and shows a very steep rise, which, when extended to 1930, gives an estimated requirement of approximately one million tons.

The result of this estimate (which is necessarily only approximate), shows that in 1930 we shall probably require at a minimum a supply

¹See facing p. 140.

of petroleum products in peace the equivalent of which in crude oil may be stated as eighteen million tons.

It is almost impossible to form any estimate of our probable requirements in war, because they would depend upon the nature of the war. It may, however, be assumed that in the event of a world war our probable requirements would be at least four or more times the figure of our requirements in peace, depending upon the precise area of operations and the character of the war.

So far, I have only dealt with the estimated requirements of the United Kingdom, but since the United States supply the whole world with petroleum, we cannot restrict our estimates to the United Kingdom if we hope to arrive at any conclusion at all in proportion with facts.

To obtain a comprehensive view of the circumstances, I have set out a comparative estimate of the petroleum situation generally in 1924 and the probable position in 1930,—using the figures in the report to the American Petroleum Institute as the basis for the United States estimate.

PETROLEUM REQUIREMENTS IN MILLIONS OF TONS.

Showing proportion U.S.A. may expect to supply on present percentage of Trade.

1924. <i>Actual.</i>		1930. <i>Estimated.</i>	
<i>United States.</i>			
Output	95.2	Output required to maintain same proportion of trade	178
Consumption of Domestic production	74.7	Internal consumption	165
Consumption of Imported Oils	13.5	Export, same percentage as in 1924	38
Export	20.5		
<i>Europe.</i>			
United Kingdom—Consumption	6	United Kingdom—Estimated consumption	13½
Remainder of Europe (excluding producing countries)—Consumption	5	Remainder of Europe—Estimated consumption	10
Total	11	Total	23½
Amount imported from U.S.	6	Amount to be imported from U.S.	13
<i>Remainder of Importing Countries.</i>			
Consumption	23	Estimated consumption	35
Amount imported from U.S.	14	Amount to be imported from U.S.	22

From this we see that the probable output necessary from the United States in 1930, if she is to retain the same proportion of the world's markets as she now holds, will be about 178 million tons, or approximately double the present output.

The report from which these figures are mainly taken shows that the visible reserve in the United States at the present rate and method of production will be exhausted under ten years unless new oil be discovered and new methods of extraction adopted. There is no reason to expect that the United States herself will suffer from a shortage for internal consumption, but it must be assumed that the outside market will not be supplied so readily nor at the same price as heretofore. It is therefore necessary to consider most carefully the question of where our supplies of oil are to come from in the event of war and what steps may be required to safeguard our position, as it will probably be quite impracticable to obtain all we shall require from America.

BRITISH CONTROLLED FUEL.

The Persian field for many years to come may be able to supply a fair proportion of what we require in the way of crude.

Persia draws a considerable part of her revenue from the oil royalties she receives, and as long as present arrangements remain, it is manifestly to her advantage to place no obstacle in the way of production.

But Persia is not under British control in any way, and, in the event of Great Britain being involved in war, it is quite conceivable that our enemies will make strenuous efforts to induce Persia to interfere with the supplies of oil to us. We must therefore endeavour, by every means in our power, to cultivate and maintain the most friendly relations with Persia and to demonstrate to her that it is to her interest to look to Great Britain for assistance in the development of her resources, for it will only be by assuring community of interest that we can hope to counter the efforts which are being made to antagonize the two countries.

At the same time, we must be in a position to assist the Persian Government to defend the oil fields if they should be attacked by a third party, or in the event of troubles in Persia rendering it impossible for the Persian Government to give the oil fields their full protection. For this purpose, it is imperative for us to maintain a strong position in the Northern waters of the Persian Gulf and adjacent countries, for if we relinquish this we shall add enormously to the difficulties of an already formidable task, and weaken our influence in the all-important matter of supplies of oil.

Turning to a consideration of the steps we might take to establish a reserve of oil in the United Kingdom, we find in the report to the American Petroleum Institute, that great stress is laid on the reserves which exist in the United States in the form of coal and shale, and the oil content of these minerals is deliberately taken into consideration when calculating reserves.

We possess an almost unlimited reserve in our coals, but we are not yet in a position to exploit them because, so far, no really efficient plant has been produced, which will give crude oil on a commercial scale at a reasonable cost.

We have a shale oil industry in Scotland, but that is dying a lingering death. It will be a national misfortune if as an industry it should have to go under, for we cannot afford to abandon any home source of petroleum.

The question of finding a practical method of exploiting our coal so that we may have a possible source of crude oil in this country, is so important from the point of view of securing our position with regard to motor fuel in the event of war, that it is strongly urged that the subject should be carefully considered afresh. The Fuel Research Board is looking into the matter, but progress appears to be very slow and the urgency of the question does not admit of any avoidable delays, for even if a practical plant could be evolved to-morrow, it would take some years to organise the industry to produce the required amount of oil.

The discovery of a commercially practicable method of dealing with our low value coals would not only assist in safeguarding our liquid fuel supplies, but would also tend to put the coal industry on a sound basis again. It would not interfere with the legitimate work of the oil companies for there is ample room for both. If desirable, our present refineries could be adapted and enlarged to take the crude produced from coal, as and when it is forthcoming.

It is suggested that it would pay the Government to offer a substantial bonus,—even to the extent of a quarter of a million,—for any person or firm coming forward with a process which would satisfy conditions to be laid down, and by which a practicable production of crude of a consistent specification could be assured at a commercial price.

CONCLUSION.

In conclusion, I will endeavour to sum up shortly the chief points I have laid before you.

- (1) First and most important is the fact that our life to-day in peace and war, is practically dependent upon adequate supplies of petroleum being forthcoming.
- (2) The majority of our supplies come from foreign sources, and we can only rely on obtaining these after the requirements of the local markets have been satisfied, with the goodwill of other countries and assured safety of sea routes.
- (3) Sixty per cent. of our supplies come from America and are completely under the control of the United States.

- (4) One quarter of our supplies come from Persia, and are controlled in peace by British interests, but the oil fields are situated in a foreign country and are not entirely under British control, and are therefore peculiarly liable to enemy interference.

The local demand for petroleum in Persia being small the amount available for export is large, and it is possible that if we can maintain our position in that country, Persia may eventually take the place of the United States as the principal source of supply for the United Kingdom ; and the key to the situation lies in Iraq.

- (5) In war we cannot afford to run the risk of finding our supply of petroleum cut off, or only allowed to come forward on such conditions as we could not accept. We must, therefore, consolidate our position in peace as far as possible, and the Government must be prepared to hold or subsidise large reserve stocks in peace against requirements in war.
- (6) Steps should be taken to encourage private enterprise in the United Kingdom to bring out a commercially practicable retorting process in order to produce crude oil from our low value coals ; and every effort should be made to save our shale oil industry from extinction.

I have endeavoured to lay before you in the short time at my disposal some of the considerations which govern the question of the supply of oil in war,—why it is of vital importance to us and from whence we may expect in the future to obtain our supplies.

I have tried to show you that it is to the East rather than to the West that we should look for supplies, and that we must use every endeavour to cement our ties with the nations in whose territories the oil is to be found. How this latter object is to be achieved it is for politicians and diplomats to decide, but, seeing that in the event of trouble leading to hostilities our freedom of action is entirely dependent upon whether we can secure the necessary supplies, it is absolutely essential that the question should be approached in a broad and sympathetic spirit.

It is also necessary to push on with the utmost speed with our endeavours to find a means of exploiting our reserves of coal in order to provide an adequate home source of supply of oil. The nearer we are to regaining our independence in the matter of fuel supplies, the easier will become our negotiations with foreign states.

There are, of course, many other aspects of oil supplies in war with which I have not endeavoured to treat, e.g., transport problems, any abnormal increase in petroleum requirements creating a corresponding demand for suitable vessels for its transport. There are also many uses to which petroleum is put besides the production of heat and power,

smoke screens, manufacture of high explosives, noxious gases, dyes, medicines, etc., but I have only endeavoured to treat with the larger issues involved.

There is a very true adage to the effect that penny wise is pound foolish, and in view of the incalculable value of the supply of oil in war, I trust that when due consideration is given to this subject the wisdom of this adage may be kept well to the fore.

DISCUSSION.

OIL PRODUCTS FROM COAL.

AIR VICE-MARSHAL SIR VYELL VYVYAN: I should like to ask the lecturer if he knows whether, both in France and in Germany, the low-temperature process of carbonisation of coal is, as I understand, on a commercial basis now. I am told it is just beginning to pay commercially. It seems to me that in this country, with our enormous stocks of coal, it is the one thing we must press on with. A great proportion of our coal is burnt in open grates, and valuable products are going up the chimney. That seems rather wrong in this country, considering the scientists we have. It is estimated that we can work about 60,000,000 tons per annum of inferior and small coal which can be converted into oil and into naphtha and motor spirit. I also hear that there is a plant working at Barnsley which has dealt with 300,000 tons of coal. I do not know whether it is yet on a commercial basis; but I believe it is so close to it that it appears to me that every effort ought to be made by the Government (and I should think the Admiralty are specially interested in this question) to press on at all costs with turning some of our surplus coal into oil products. It is all the more important because, as I have said, a great deal of attention is being paid to the subject both in France and in Germany.

FUEL FOR AEROPLANE ENGINES.

LIEUT.-COLONEL W. A. BRISTOW: I appreciate that Admiral Slade has not had space in his paper to deal with some rather important subsidiary questions that arise. He mentions that the Air Force must, of course, be supplied with petrol of certain characteristics, but in this connection I should like to point out that since the late War the design of engines has altered to such a degree that at the present time the Air Force cannot run on ordinary petrol. The standard fuel at the moment consists of petrol and about 20 or 30 per cent. of benzol; so what I want to ask Admiral Slade is this: Taking into consideration the following points, what steps are contemplated for the supply of a suitable fuel for aeroplane engines, bearing in mind that (a) the units requiring fuel may be scattered over an area from London to Rangoon; (b) that even at this juncture it is impossible to run high compression aviation engines on straight petrol, no matter how good it may be; and (c) that in the event of war the present large proportion of benzol in the fuel may have to be discontinued altogether, owing to its being required for explosives or owing to transport difficulties. These very grave factors did not exist in the last war, or only to a very small extent, because the design of engines was very different from what it is to-day; but even at the close of the war we had begun to experience the difficulties arising from a lack of suitable fuel. There has also, since the late war, been a tendency in the wrong direction with regard to the kind of fuel from the point of view of weight. The aeroplane is not

concerned with the volume of fuel it carries; it is concerned with the weight; and there has been a thoughtless tendency for several years past to keep on increasing the specific gravity of the fuel. The importance of this may be gauged from the fact that with the difference in the specific gravity of only .05, the usual range of some classes of machines in the service may be reduced as much as sixty miles per load of fuel, and I should like to know if this fact is being borne in mind, and whether anything is being done to supply fuel for aviation engines of a lower specific gravity rather than a higher.

OIL FOR FIRING BOILERS AND FOR INTERNAL COMBUSTION ENGINES.

ENGINEER-CAPTAIN WM. ONYON, M.V.O., M.I.N.A., R.N.: I propose to speak entirely as a naval engineer. Since I retired from the Service in 1913, I have joined the firm of Beardmores, and we have built, including forty warships, eighty ships burning oil under the boilers, and a good many burning oil in internal combustion engines. I should like to ask Admiral Slade, when he gives us the figures of the quantity of oil supplied by America, Persia and other parts of the world, whether he can tell us what part of the world the oil comes from which suits the internal combustion engine best. We use a different oil under the boilers from that which we use in the internal combustion engine; as one can tell from the price, which is in the neighbourhood of £5 a ton for the oil used in the internal combustion engine, and perhaps only £3 5s. od. a ton for the oil burnt under the boilers. Then it is very necessary that we should not make any smoke. I remember that when I was building a ship called the "Sharpshooter" (a destroyer), that for the trials the Admiralty sent us Mexican oil, and this contained about 3 per cent. of sulphur. The result was,—as there was a very heavy sea running and a very high wind,—that the smoke was picked up by the fans and driven into the boiler rooms and every mother's son was driven out of the boiler-rooms; no one could possibly stay there. This was Mexican oil with about 3 per cent. of sulphur. I do not think any attempt has been made since to again use this Mexican oil under the boilers, unless it has been adulterated or mixed with oil of other quality. But I want to point out that it is necessary that in war-time we should make no smoke, and unless we have the very highest grade of oil in our warships we are very likely to give away the position of our ships to the enemy. I remember in the "Dreadnought" days, Lord Bearsted told Lord Fisher that the Admiralty were cutting themselves off from three-quarters of the world supplies of fuel owing to their absurd specification. The "absurd specification" meant, I think, that you had a flash-point of 200 degrees, and a very small percentage of sulphur in the oil; and unfortunately the result of that was that the specification got altered, and all sorts of oils crept into the Navy for use which were inferior, and made an enormous amount of smoke. I believe the Admiralty control some of the supplies of shale oil in Scotland. My idea is that they should control the whole of it. During the war we used a lot of shale oil in destroyers, and were very glad to get it, because it was of very high quality. It would be very interesting if the lecturer could tell us in what part of the world the supply of oil is to be found which is best for use in the internal combustion engine.

BRITISH CONTROL OF OIL; THE STRATEGICAL ASPECT.

CAPTAIN E. ALTHAM, C.B., R.N.: I only want to add one or two small points which may be of interest in elaboration of the absorbing lecture to which we have listened, the first concerns an aspect of oil supplies which I have studied somewhat

closely. The lecturer has emphasised the importance of British control. Now that word "control" seems to me to change its aspect very considerably when we pass from peace conditions to those of war. In times of peace, "control" means chiefly financial control—control by British financial interests of the various sources of oil production. In war, financial control is at best a rather poor security for our oil supplies; and I would suggest that in order to ensure our oil supplies in war we must look to physical rather than to financial control. The point is important, because there are certain commercial interests which have been contending very strongly of late the importance of financial control, and have been using the argument that it will ensure to the Empire its oil supplies in war. This, in my humble opinion, it will not do. I do not mean to detract for a moment from the commercial advantages of having British financial control of as much oil as possible; but it is a very dangerous doctrine to regard that form of control as a security in war.

Then the second point is what I may call the strategic situation of our oil supplies. Admiral Slade has emphasised the importance of sea communications; as the greater part of our oil supplies at present comes from the Western Continent we are, of course, in a very strong strategic position to safeguard the transport of those supplies to these shores, and also to intercept those going to Europe in the case of a Continental enemy. That position is neutralised to a certain extent in the case of France, of course, by the fact that she has better bases for submarine work than Germany had, if she should choose to use submarines to intercept our supplies. When we turn to the question of the strategical position of Eastern oil supplies, it is well to remember that those supplies might be very considerably curtailed in the event of a war with a Continental enemy, by reason of the bottle-neck of the sea pipe-line where it passes through the Mediterranean. I think it ought to be realised that until our anti-submarine organisation is again fully developed, the passage through the Mediterranean in the event of war with France or Italy would be decidedly precarious for fleets of tankers. Although, therefore, the Eastern supplies are under British physical control to an appreciable extent, the potential dangers to the sea pipe-line to the East should be borne in mind.

Again, this is not the only country within the Empire that must be assured of its oil supplies in war. There are, for instance, the far distant Dominions, Australia and New Zealand. If they are to be an asset to the Empire and if their mechanical life is to be kept going in war, they too must be assured of their oil supply. The lecturer has pointed out that they have no resources of their own. Doubtless they get most of their oil trans-Pacific from the American continent, and they will also be able, perhaps, to get a certain amount from the Persian and East Indian sources; but that assumes that their sea communications, their sea pipe-lines, will be safe in war. This reminds us once again of the very great importance of maintaining our sea security in the Far East. I need not elaborate the argument, but it is not too much to say that at the present moment that sea security is very far from being assured, and therefore oil supplies to that portion of the Empire might be in considerable jeopardy.

The lecturer has also emphasised how very poorly off for oil the British Empire as a whole is. I believe I am right in saying that only something like 2 per cent. of the world's oil supplies comes out of the British Empire. In the course of a recent trip across Canada I was rather struck by the potentialities of developing oil supplies in that vast Dominion. In Alberta, particularly, there seem to be indications of oil resources. Amongst these are vast masses of bituminous sands.

The extraction of oil from them awaits the discovery of a commercial process but that, doubtless, is only a matter of time. As an instance of what is being done, the Imperial Oil Company, which is a large Canadian-American concern, has lately completed a very big refinery which cost \$2,500,000 at Calgary, in Southern Alberta. I do not imagine they have done this mainly with a view to importing crude petroleum, but probably in anticipation of finding more oil locally in the near future.

There is just one other point that occurs to me, and that is that we have been impressed very much this afternoon with the growing demands for petroleum of every sort, kind and description. Some of those demands can, of course, only be met by oil, as for instance, in its lubricating form, but others relate to the use of fuel for motive power. I would suggest that we ought to develop other forms of liquid fuel, such as power alcohol. Power alcohol is already being used satisfactorily in some parts of the world—in South Africa particularly, I believe—for driving cars and so on; and though it is not quite so satisfactory as petrol, it does present already a practical alternative for certain uses of petroleum, and, if developed, might ease up the very heavy demands which are at present being made on that fuel for motive power. Power alcohol has the great advantage that it can be made out of all kinds of refuse, vegetables, and so on. It should be possible to increase the cultivation of this vegetable matter within the Empire, and in due course to get yet another alternative to the conversion of coal into liquid fuel.

GENERAL SIR GEORGE ASTON: I dealt, years ago, with Imperial strategy at the Staff College, and I accentuated the importance of oil. One used to point out—and it was, of course, a perfectly obvious thing—that strategy depended upon movement, and that the British Navy was entering upon a new era, when movement would depend upon oil. At that time, twenty years ago, the British Empire only supplied one-seventieth of the oil output of the world.

I should now like to put in one plea, from the military point of view—from the soldier's point of view. The point has been thoroughly developed that, as we have not got our own oil, we must depend upon other people's oil, so the whole of our sea-power depends upon sufferance. Since we depend upon the sufferance of other countries, we must store. I remember very well being chairman, just before the Great War, of an Admiralty Committee to find out how to defend the oil that had already been stored; but it seemed to me that we attacked the problem in the wrong order. It was most desirable that the military authorities who had to defend the oil should have been consulted about the defensibility of the sites where it was to be put. That is, I hope, being attended to now, but it was really a very serious omission in the old days.

One point in connection with sea power in general, and the demand for British sea power. I think the point has been brought out thoroughly by the lecturer that, accepting that our sea power is on sufferance, and that it is largely on sufferance by the United States of America, because most of our oil comes from there, it is quite hopeless for us to accede to any proposal to use the British fleet for any form of sanctions unless the United States backs up those sanctions.

LECTURER'S REPLY.

ADMIRAL SIR EDMOND SLADE (in reply): With regard to the question put by Sir Vyell Vyvyan about the low-temperature carbonisation plant at Barnsley, I would say that it is a very hopeful plant indeed. The principal trouble, so far as I know, is the difficulty of working it successfully on a commercial basis, but

I see no reason at all why that should not be got over eventually. A great deal of attention is being paid to the question of low temperature carbonisation both in France and Germany.

With regard to the questions put by Colonel Bristow. The real point is, I think, that whatever fuel is used for aircraft, the raw material has to be imported into the United Kingdom. It then has to be refined and a suitable fuel obtained. Therefore it is the raw material which really interests us from the point of view of Oil Supplies in war, and this raw material will come unquestionably from the East and not from the West. In order to save transport in war it is advisable that the required fuel shall be prepared as near as possible to the place where it will be used, and that so far as may be it shall not be necessary to import to the refinery which is making the fuel any large quantity of other materials for the purpose of blending. It therefore appears to me as if it would be better generally to design an engine to give the best results when using fuel refined from the crude which we shall be forced to use during war, rather than to ask for a composite fuel to suit a particular engine, and that the designers should work in collaboration with the refiners, in order that the best results on both sides may be obtained. We may get crude from America, but we cannot be certain of it, and it will entirely depend upon whether America is friendly or otherwise as to whether we get that crude or not, and the only crude in any quantities that we can be certain of is the Persian crude. When it comes to war, the amount of crude that we shall require in this country may run to 30, 40 or even 50 million tons a year, and unless we can be assured of that supply either by importation or from resources held in the country, we run very serious risk of disaster. Therefore, to go back to the question of aircraft engines, I know this is a reversal of present policy, but I am convinced that it is the correct policy—namely, that the engines should be designed to use a certain fuel, a fuel that they can be sure they will get, and not that the refiners shall be asked to make a fuel to suit a certain engine. The design of engines can be varied to any extent, but the crude oil that comes out of the ground cannot be altered. That is settled for us by Dame Nature, and Dame Nature is not going to change it for the purpose of pleasing the engine designers.

With regard to the question of distribution, the first and absolutely essential condition is that we have the command of the sea and retain it. Then, provided a scheme is prepared and arrangements are made to draw the required fuel from the most conveniently situated refineries, distribution in war will not be any different or any more difficult than the distribution of any other material of vital importance. Thus we may assume that supplies for the Eastern area will come from Abadan or India; supplies for Europe from Abadan, Egypt and the United Kingdom; and for Australasia the supplies should come from Melbourne; but it is essential that there should be a definite policy, and that policy can only be arrived at by collaboration between the Air Ministry, the Admiralty and the refineries.

In reply to the question which was put by Engineer-Commander Onyon, as to the best oil for internal combustion engines. Practically any of the good crudes can be refined nowadays down to an oil which gives excellent results in internal combustion engines. The Persian crude gives first-rate results, and there is a very large amount of it now being used in motor ships. Borneo oil gives very good results; Rangoon oil gives very good results; and a great many of the American oils give excellent results.

Now with regard to the questions raised by Captain Altham: control in peace is financial; control in war is physical; but control in peace does not connote control in war. We may have financial control of all the things in the world, but

when it comes to war we may find that we have not got control of any. It is vital to us to secure control of the necessary supplies of liquid fuel if we are to go on living as a nation, and do not wish to fall under the dominion of the United States or any other country which supplies oil. Unless we make ourselves secure in this matter we must inevitably dance to the tune that the countries with the oil choose to set to us; and, therefore, I repeat it is absolutely essential to develop such resources as we now possess in the shape of coal, to, at any rate, eke out the supplies of oil which we may draw from other sources. He referred to Canada, but the probability is that the whole of that oil will be absorbed in the North American continent.

With regard to power alcohol, it is being made on quite a considerable scale, and is being successfully used; but the amount of raw material which has to be transported and treated puts it entirely out of court, so far as this country is concerned, in war.

I think I have answered Sir George Aston in what I said about the importance of making ourselves absolutely independent of any foreign country. We cannot afford to run the risk of having our policy dictated to us. We are living in a fool's paradise, because we appear to think that since we can easily obtain our supplies of oil in peace we shall continue to do so in war, and that because we came out on top during the last war we shall come out on top in other wars, no matter how the conditions have changed.

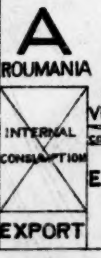
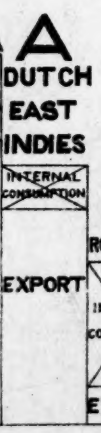
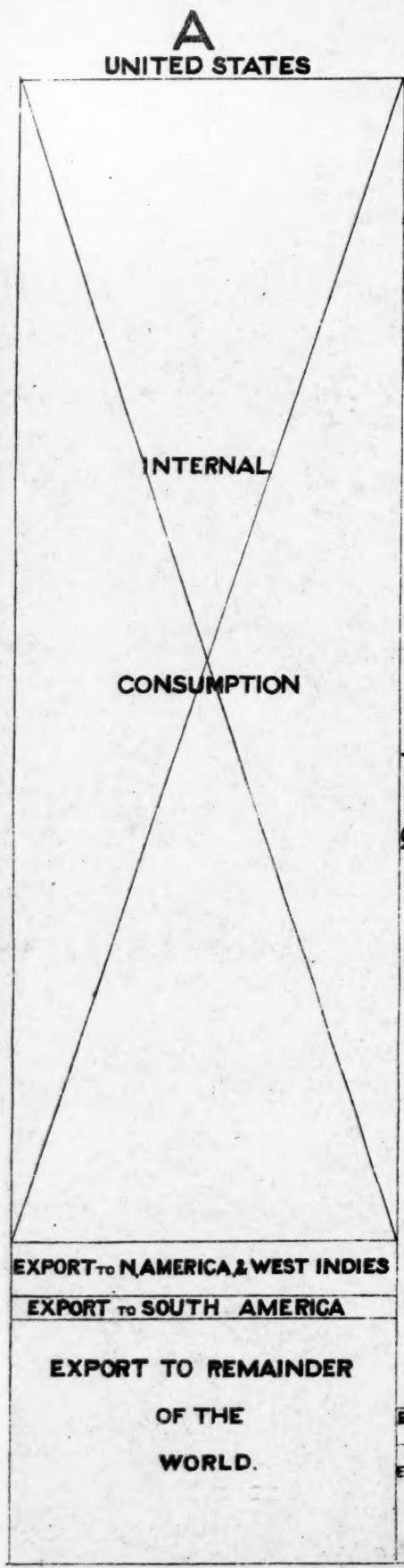
I am of opinion that the solution of this question is a matter of life or death to this country, and that unless we place ourselves in the position of being able to obtain freely the liquid fuel necessary for the production of power to run our essential services in war, we not only run grave risk of failure in war, but the hands of the Government are tied in negotiations in peace, because we dare not attempt, in the last resort, to enforce our demands.

THE CHAIRMAN: I think you will agree with me that this is one of the most interesting, instructive and useful papers that has been read in this Institution for a very long time. I do hope that it will be elaborated in the Press. No doubt you recognise, with me, that there has been a tremendous tirade in the Press against our staying in Iraq, and also a section of the Press is very anxious to do away with our Fleet altogether. Some appear to want to abolish the Fleet and the Admiralty and reduce the Empire to insignificance. Well, I hope to goodness that the most interesting and instructive lecture which has been delivered here to-day, and the very interesting contributions which have been made by those gentlemen who have been kind enough to take part in the discussion, will bring home to these members of the Press who have been wanting to do away, I think, also with Mr. Amery because he wanted to retain Iraq, the importance of the Fleet and of our oil supplies. I hope that this Press will now turn round and recognise that it is necessary to stay in Iraq. It is necessary to have a Navy to ensure that the oil which we do not produce ourselves can be brought safely to our shores, and I hope that everyone who has the pleasure of reading this lecture, or even an epitome of it, will set to and try and think out how oil can best be stored so as to be safe from aircraft, how it can be produced in this country, and will also take part in a crusade, shall I say, to ensure that our sea-power is not let down and that the influences we now possess in the Far East to obtain oil shall not be let down either. I wish you to join me in a hearty vote of thanks to Sir Edmund Slade for his admirable paper.

The vote of thanks was carried by acclamation.

GENERAL SIR EDMUND BARROW, G.C.B., G.C.S.I., thanked the Chairman for presiding at the meeting which then terminated.

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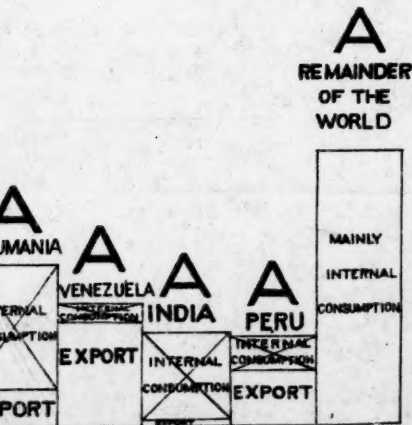
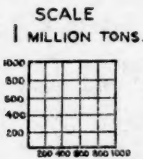
A. PRODUCTION OF
RETAINED IN EA
CONSUMPTION,
B. IMPORTS OF PE
KINGDOM SHOW
C. IMPORTS OF PE

DIAGRAM 1.

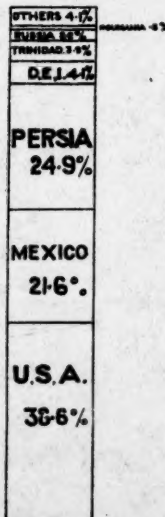
TION OF PETROLEUM, SHOWING AMOUNT
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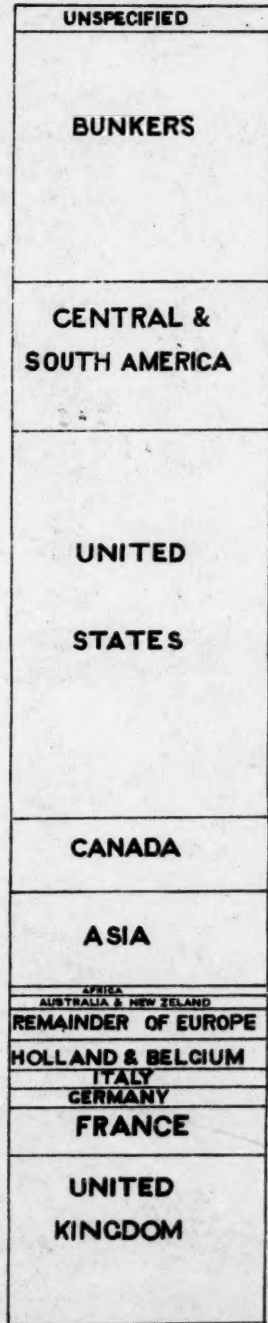
S OF PETROLEUM INTO ALL COUNTRIES.



B
IMPORTS INTO U.K.
IN 1924



C
IMPORTS INTO ALL COUNTRIES
IN 1924



LOGARITHMIC CURVES SHOWING:-

SCALE
PER CENT

.500
.480
.460
.440
.420
.400
.380
.360
.340
.320
.300
.280
.260
.240
.220
.200
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.160
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.120
.100
.90
.80
.70
.60
.50
.40
.30
.20
.10
.5

A. RATE OF INCREASE IN CONSUMPTION OF 1 FUEL OIL

2 LUBRICATING OIL

3 MOTOR FUEL (BENZ)

B. RATE OF INCREASE IN 1. GROSS TONNAGE OF MOTOR VESSELS

2. GROSS TONNAGE OF VESSELS OVER 100

3 NUMBER OF MOTOR VEHICLES ON TH

BROKEN LINES SHOW ESTIMATED RATE OF INCREASE IN CONSUM

OIL & MOTOR FUEL & RATE OF INCREASE IN NUMBERS OF MOTO

N.B. THE VERTICAL DISTANCE BETWEEN ANY TWO POINTS ON THE
MEASURED ON THE SCALE GIVES THE PERCENTAGE INCREASE
HIGHER OVER THE LOWER.

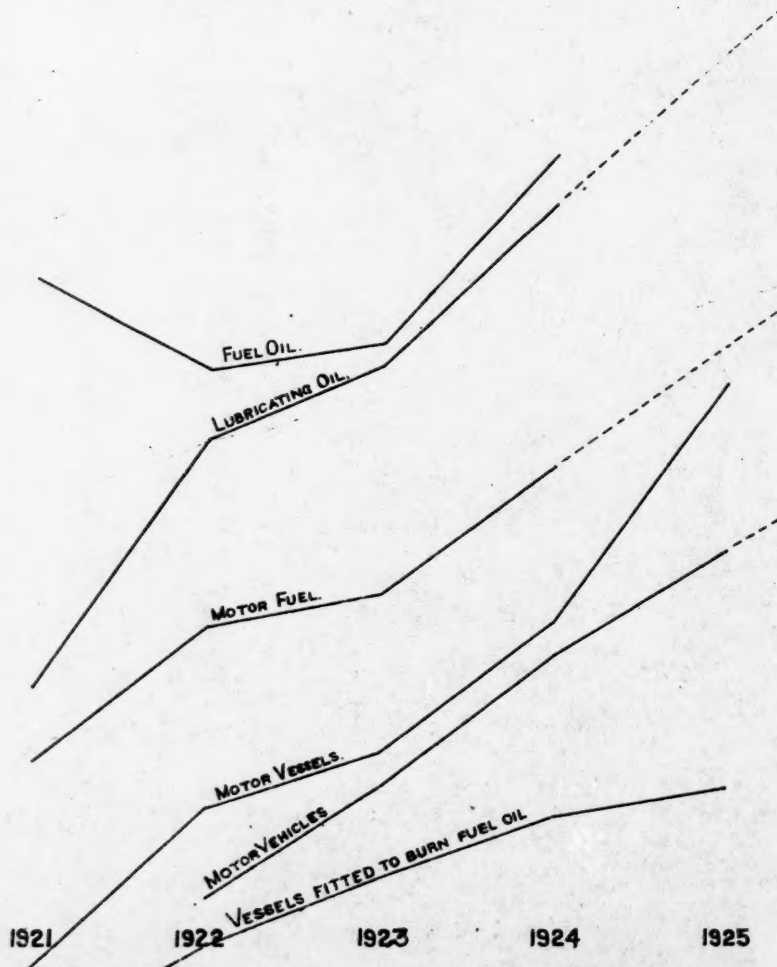


DIAGRAM II.

NG OIL
EL (BENZINE & KEROSENE)
VESSELS (I.C. ENGINES) OVER 100 TONS GROSS.
OVER 100 TONS GROSS FITTED TO FUEL OIL
S ON THE ROAD
N CONSUMPTION OF LUBRICATING
OF MOTOR CARS UP TO 1930.

ON THE SAME CURVE
CREASE OF THE

172 %
OVER 1924 CONSUMPTION
EQUALS 1040 000 TONS

136 %
OVER 1925 CONSUMPTION
EQUALS 5 020 000 TONS

78 %
OVER NUMBER IN 1925
EQUALS 2 400 000 VEHICLES - AVERAGE
OR 2 700 000 MAXIMUM SUMMER NUMBER

1925

1926

1927

1928

1929

1930

PRODUCTION OF OIL FROM COAL.

THE LOW TEMPERATURE DISTILLATION PROCESS.

(In the lecture on "Oil Supplies in War," Admiral Slade has shown that there is a weak spot in the armour of Imperial Defence, due to the fact that the mobility of the fighting Services and the whole machinery of our commerce are dependent on petroleum which has to be obtained from foreign sources of supply.

The low temperature distillation ("L" and "N") process of procuring oil from coal is one of the latest and most promising attempts to initiate a new industry which, if it is successful, will go far to restore Imperial security and to solve the very grave economic problem which the coal mining industry has to face to-day.

A 10-ton demonstration plant is now in operation at Barnsley, Yorkshire, and is the one referred to in the discussion on the foregoing lecture (see p. 135). The following article has been compiled from material kindly supplied by Sensible Heat Distillation, Ltd., the proprietors of the process).

A HUNDRED and fifty years ago England captured the world's markets because she had cheap fuel and iron in close proximity. Twenty-five years ago the Navy and the Mercantile Marine were almost entirely coal burning, the motor car was still something of a luxury, aircraft in their infancy. Gradually, however, there arrived what may be called the oil era. To-day the demand for petroleum and its various products is ever increasing, while England finds serious difficulty in marketing her coal at economic prices.

The fuel which is most vital to the nation's life and security no longer comes from home sources but has to be imported from abroad, by far the greater proportion coming from countries outside the British Empire. Science and invention would appear to have laid siege to the very foundations of Imperial Defence and our domestic well-being; yet science and invention should be able, not only to recover for the Empire its former position of being self-contained in these matters but they should also be able to restore to the coal and iron industry a full measure of their former prosperity. Science has already proved that oil of a standard comparable to the best crude petroleum can be extracted from British coal, it has remained for invention to discover a process of extraction which shall enable this to be done on a commercial basis. Put into business language, what is required is a new basic industry capable of meeting its overhead charges and its wages bill and still able to show a profit of at least 5 per cent. on capital.

This, it is claimed, invention will do with the extensive adoption of what is known as the "L and N" Process for the scientific distillation of coal.

THE "L AND N" PLANT.

The accompanying diagram shows the main features of the "L and N" Plant. The principle on which it works is as follows:—

Coal or other carbonaceous materials are brought into direct contact with a hot gas in a large tubular retort, very similar to those used in the so-called ore roasting or cement kilns.

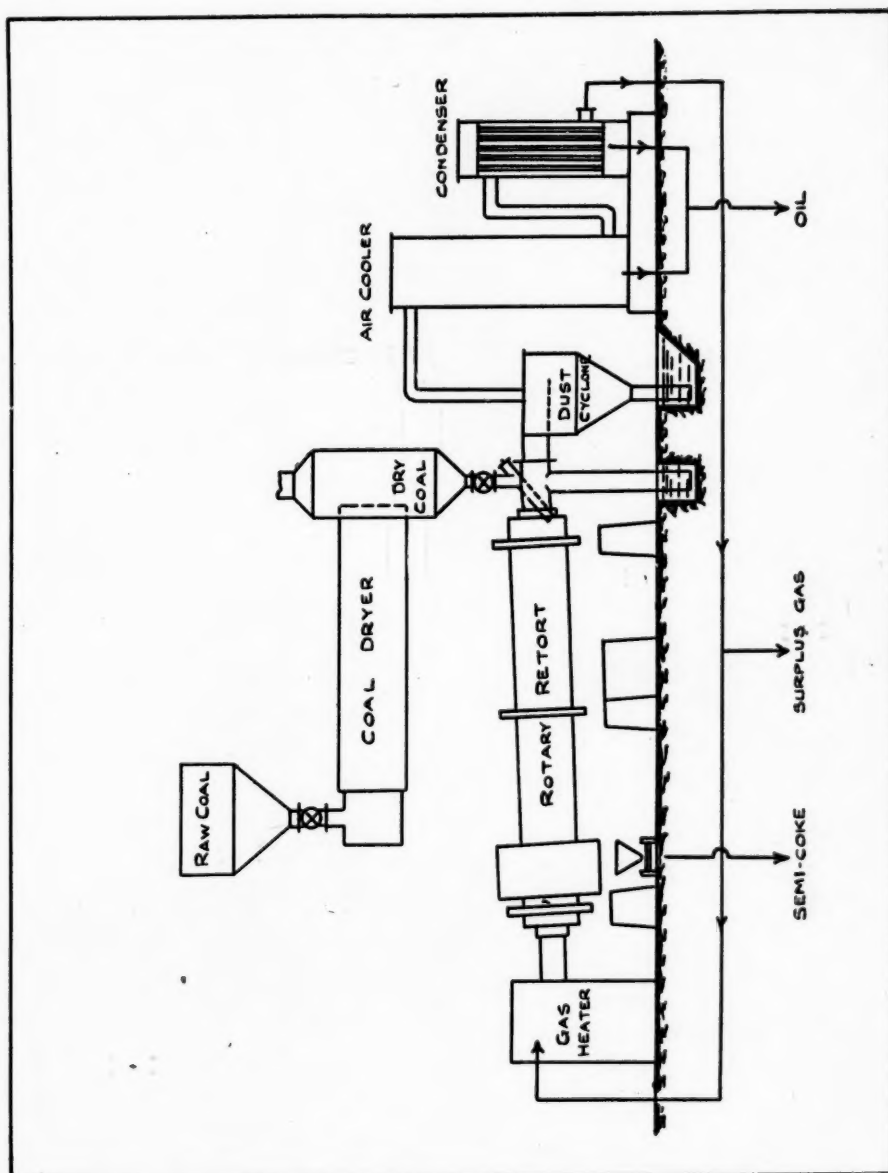
A retort for dealing with 100 tons of raw material per twenty-four hours will consist of an inclined steel tube, somewhere about 80 ft. to 85 ft. long and 9 ft. inside diameter. This is lined inside with fire brick of a thickness of 8-10 in. The tube is mounted at a slight angle of 1 in 20 to 1 in 25, with the horizontal. It is made to revolve at a rate of 30 to 60 revolutions per hour.

Owing to this inclination and rotation, the material fed in at the top passes slowly through the tube to the lower end, being subjected *en route* to a continuous current of hot gas. This gas is in direct contact with the raw material and heats the latter up to the various distillation temperatures. The volatile matters contained in the raw coal are given off in the form of gaseous or liquid hydrocarbons, that is to say, oils. These oils are recovered from the gas on subsequent condensing or cooling down and removed from the plant to the storage tanks. The gas can be re-heated and re-circulated through the retort an infinite number of times.

THE PRINCIPLE OF THE PROCESS.

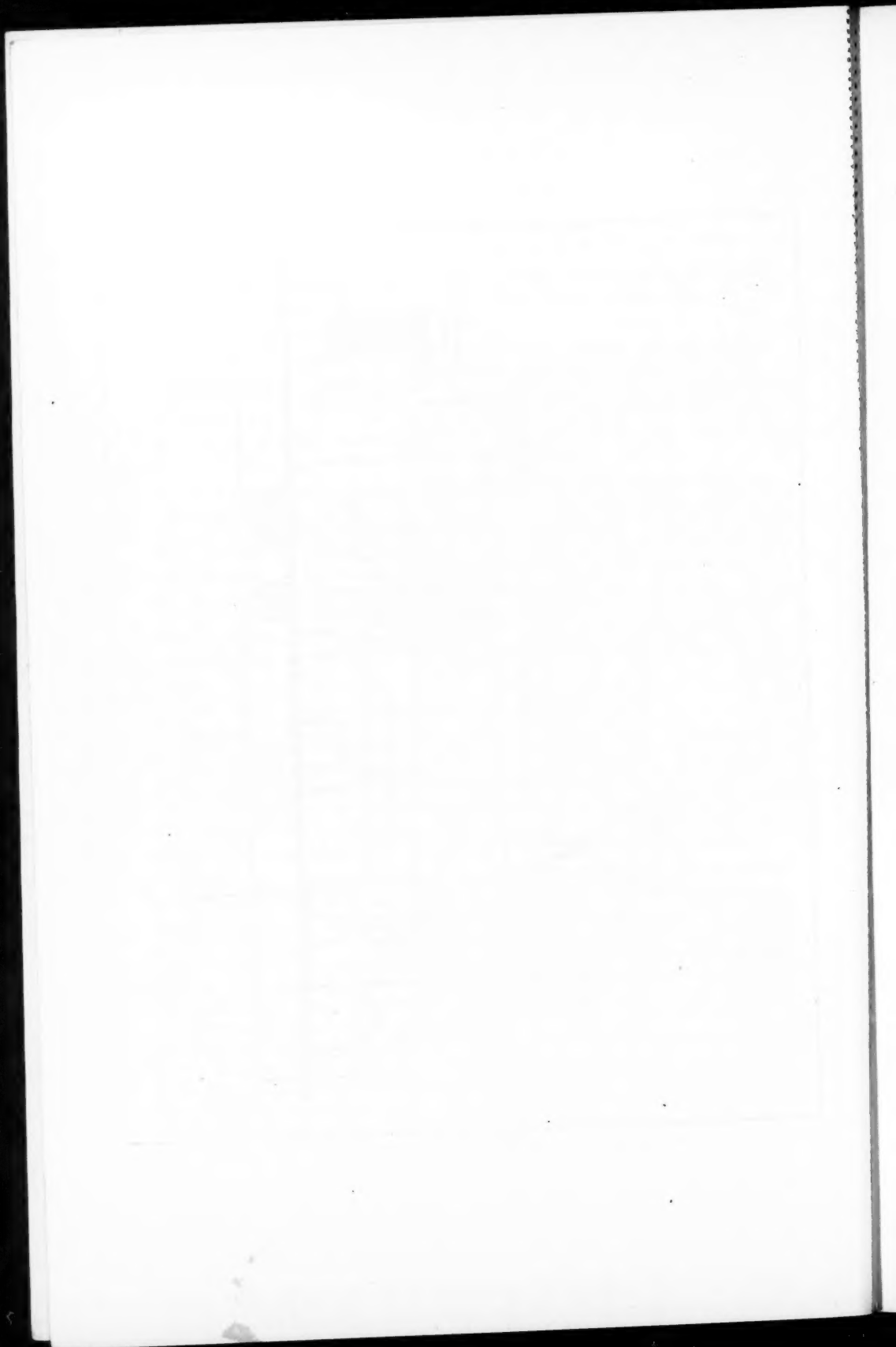
In the past low temperature distillation has not been a commercial success because elementary principles have been ignored. It has been found necessary to make an absolutely clean sweep of all preconceived ideas; to attempt low temperature distillation on the classical lines of high temperature distillation is unsound, and is the reason why low temperature distillation has been, quite wrongly, brought into disrepute.

The new principle consists in heating the retort internally instead of externally, that is to say, to subject the coal to the direct action of an inert hot gas. This gas may be of differing composition provided only that it should not contain free oxygen. Under these conditions coal will give off its oil and gases much more readily than in externally heated retorts. By the new principle each single particle of coal is surrounded by gases of the right temperature and consequently the heated surface is enormously greater. It is comparable with the difference existing between the old type of boilers and the modern water tube boilers. The secret of successful distillation is to bring the coal into as intimate contact with the heat as is possible whereby the capital cost of plant and the time of the process are reduced and, by utilising rotary retorts similar to those employed in cement works, it is possible to increase vastly the size of the units handled, which means greatly increased efficiency.



PRODUCTION OF OIL FROM COAL

THE "L. & N." PROCESS



PRODUCTS OF THE PROCESS.

Tests conducted, using samples of not less than twenty tons of various kinds of coals have given the following yield in gallons of crude oil per ton :—

Barnsley bed coking slack.	Garnforth non coking slack.	South Wales coking smalls.	Dunfermline non-coking mixed nuts.	Yorkshire cannel coal.	German bituminous brown coal.
17.5	18.8	19.0	21.5	36.0	31.0

It is claimed that the oil produced by the "L and N" Process, from all kinds of bituminous coal, approaches, in quality, the best Pennsylvania crude oil. The quality of the coal does not, it is said, affect the quality of the oil but it does, of course, affect the yield per ton.

Statistics compiled from trials already carried out indicate, it is stated, that petrol, diesel oils and fuel oils can be produced by refining the crude coal-oil at a cost not exceeding present day supplies purchased from abroad. Moreover, lubricating oils, officially pronounced to be of very high quality have also been manufactured.

When coal is subjected to a temperature of 800° to 900° Fahr. it gives off its volatile matter, partly in the form of oil and partly in the form of gas. The latter, too, of course, has a commercial value. There remains, at the end of the process, a skeleton of carbon cells which has been named "L and N" coke in contra-distinction to the high temperature residue which is ordinary coke. It is claimed for this "L and N" coke that it reacts more easily with oxygen than ordinary coke does; the result is that it will burn easily in an open grate where the latter will not.

It is also claimed that experience to date indicates that it will actually pay to work coal of so poor a quality that, at present, it is not worth while raising it from the mines, while the value of the oil alone is more than sufficient to make the process a paying concern.¹

¹(Other expert authorities consider it probable that the commercial success of any low temperature carbonisation process must depend primarily on obtaining a suitable market for the coke. The quality of this coke, its ash contents, etc., must vary according to the quality of the coal from which it is obtained, and since to obtain oil in any quantity will necessitate the treatment of a very large tonnage of coal, the use of the coke product must be a most important factor in the commercial success of the process.—Ed.)

THE MOSUL PROBLEM

By AN EASTERN TRADER.

YEARS hence, we who know the Turkey of to-day will realise that we lived in an interesting period of evolution and, too late, perhaps, we shall get a proper perspective of events. To-day the difficulty is to preserve one's balance and judgment, and it is not easy to avoid being influenced either by confirmed optimists or by confirmed pessimists.

The all-absorbing topic is, naturally, the Mosul question, for it is not yet clear that the decision of the League is a settlement or even that it will produce a settlement.

The decision, although it has caused no general surprise, is a rude shock to the Turks, and they are smarting under the sense of what they have convinced themselves is an injustice. What is a surprise to them is that England is firm, for they thought that we should waver. They remember Mudania and Lausanne, and, banking on the supposition that, under no circumstances, would either public opinion at home, or the influence of the Labour Party, allow our Government to call their bluff, they have gone rather far in their declarations to their own people. They have noted the attitude of papers like the *Daily Mail* on the question, and have attached undue importance to it. This attitude of a certain section of the press at home has maddened those who realised it was merely encouraging the Turks to risk war. If trouble ensues the responsibility of that section of the Press will be a very heavy one.

One of the most amazing facts, after the experiences of the war, is that, not only the Turkish public, whose opinion counts for little, but even the British public, have known nothing of the real situation, until lately, and, even now, it is not fully appreciated. The disturbing feature is, however, that the decision rests almost entirely with the Turks. What are the known facts? They are that, for months past, the Turks have kept a large force, estimated at 50,000, near the Mosul frontier, that everybody returning from Angora was impressed with the declaration of all politicians and officials there that if the Geneva decision went against them they would take Mosul, that they can take it, that the upkeep of such a force is a tremendous expense to them which they can ill afford, that Soviet diplomacy is doing its level best to urge the Turks on, that some treaty or agreement was recently made between Turkey and Russia, and that the Turk, having beaten the Greek, is convinced he can beat anyone.

Also he realises that the Mosul highlands are essential to him if he is ever to regain Bagdad and the Persian Gulf, whereas we know that those highlands are essential, economically and strategically, to Iraq.

There must be a lot of hard thinking going on at Angora just now. A certain section, including the General Staff, were known to be for taking Mosul and putting the League and ourselves before a *fait accompli*, but a more prudent section, including Moustapha Kamel and Ismed, think otherwise, and they will probably prevail. So far, there is no sign of the decision.

Is it not possible that this question is a much bigger and more important one than that of a frontier between Turkey and Iraq? When we remember that we were foolish enough not to renew our treaty with Japan, that, as a consequence, Japan has turned to Soviet Russia, and fixed up a secret treaty concerning not only China, but the Near East also, that Turkey has recently fixed up a secret treaty with Russia, and that one day we may find Europe up against a combination of Russia, China and Japan, that Russia is trying to make a catspaw of Turkey to facilitate her traditional policy of an outlet to the Persian Gulf, it gives us furiously to think. Turkey's attitude to Russia is a complex one. She is afraid of her, but has no confidence in the disinterestedness of any European power. She is afraid of communism, but is not disinclined to accept Russia's offer of help against Europe. The Soviet representative at Angora is astute and persistent, and he is there all the time, whereas we are not in such close contact. Turkey must shortly decide whether she will throw in her lot with the East or with the West. It will be an important decision, not only for Turkey, but for Europe. A great factor for peace is that Turkey cannot finance war for more than a month or two, and, though Russia would lend full moral support and a certain measure of material support, such as ammunition and aeroplanes and guns, these would be insufficient to ensure success.

Those who understand the true position admire the attitude of the British Government and hope—in the interests of England—that it may continue firm and conciliatory. We British are disliked, but our prestige has been recovered. Our Ambassador is respected, and the dreadful days of Mudania and Lausanne are over.

If the Turks commit no act of war, then, when the excitement of the League decision has passed, our diplomacy will have a wonderful opportunity to come to some political and economical arrangement with Turkey, involving a security pact between Turkey, Iraq and Persia. At present their pride is shocked by the mention of a loan, but, in due course, if this were merely incidental in form, it would be, nevertheless, material in fact.

Everyone is looking for straws to see which way the wind is blowing, but, so far, Angora is the sphinx itself. English residents on the Asiatic side of the Marmora, Pendik, etc., were recently given twenty-four hours' notice to clear out, but no reason was given. In one case the Turks

said that it was on a telephonic order from Angora. One English family on a farm there have had to leave all their cattle and everything as they stood. This is a mystery, but not necessarily a straw.

The treaty recently concluded between Soviet Russia and Turkey is most significant and important, as showing that the real principals in the Mosul question are England and Russia, and that Turkey would be of quite secondary importance, if we had to consider her alone.

More recently, we learn, Mr. Baldwin and the Turkish Ambassador have had preliminary conversations with a view to seeing whether an arrangement is possible between the two countries. The Turkish Press is already modifying its Anglophobe outbursts. The question is—what are the secret clauses of the Russo-Turkish treaty, and to what extent will that treaty interfere with, or limit, an arrangement between England and Turkey.

Of one thing we may be quite certain—that Russia will move heaven and earth, and her representatives will stick at nothing, to prevent such an arrangement. As has been said, the Soviet representative is continually at Angora, and he does his share of entertaining—with an eye to business—whereas we have no one there at all. It is almost incredible, but, unfortunately, it is a fact. Our Ambassador is generally in Constantinople, and, for all practical purposes, he might just as well be in London. This is no exaggeration. Constantinople is not Turkey at all—politically. He has paid one or two formal, and short, visits of courtesy to Angora, and that is all.

It does not yet seem to be realised by the British Foreign Office that present-day Turkey is not pre-war Turkey, and our diplomacy has not yet adapted itself to present conditions. Most business men have realised they must do so, and diplomacy is the most important of businesses, for our country's future success, and even its existence, depends largely upon the efforts and the results of our foreign policy. It is imperative that we should have someone permanently at Angora. Even the Americans, who have a much less direct interest than we do, have a diplomatic liaison always there. The Frenchman, M. Sarraute, is nearly always there, and so is the Italian. Of course, it is dull and uncomfortable, but that was not a factor during the War! For a tenth of the cost of our Constantinople Embassy and Staff we could have real contact at Angora.

If the necessity of having a permanent representative at Angora is accepted, as it must be sooner or later, the question will arise, who is the man to go? It is to be hoped that the choice will not be made on the grounds of Foreign Office seniority, but that a careful selection will be made. It must be someone who, while retaining his dignity, is adaptable to conditions and circumstances there. Much will depend upon his personality, for he will find himself in an atmosphere of suspicion and of *méfiance*.

We have already lost much by our lack of contact, but it is better late than never. For our diplomatic service in Turkey to be really effective, we should banish from our memories pre-war Constantinople entirely, and the fact that there is a large and comfortable Embassy building in the old capital should not be allowed to tie us down there. It is true that a site has been selected for an Embassy building at Angora, and that the Embassy architect has prepared plans for approval, but our policy should not be allowed to wait on a building which has not even been commenced. It may not be convenient for our Ambassador himself to go to Angora at once, though that would appear to be preferable, but, at any rate, someone should be sent there and remain there, and he should not be a junior.

To-day the Turks have three alternatives—(1) to come to a friendly arrangement with us, under which we, perhaps, would make some material economical concessions, and as a consequence of which the Mosul question would gradually diminish in importance—this is the best we could hope for; (2) the complete failure of our efforts to make such an arrangement as (1), and, as a consequence, no improvement in the relations between the two countries, the Turks continuing their threats to march on Mosul in the spring after the snow melts in the mountains; (3) a state of affairs somewhere between (1) and (2) under which some sort of agreement is come to between the two countries, but under which the Mosul risk is not entirely eliminated.

My own impression is that the present policy of the Turks is to avoid (1), that is to say, to avoid any arrangements which would tie their hands as regards Mosul, for they believe that, with their arrangement with Russia, it would pay them to retain their independence vis-à-vis Great Britain, and vis-à-vis Europe generally, not only on the Mosul question, but in other matters, such as the payment of the coupons on the loans made to them by Europe.

In this connection it is interesting to note that Turkey has come into line with Soviet Russia vis-à-vis Europe on two important questions, namely, the non-payment, if not actual non-recognition, of pre-war debts, and hostility to, and non-recognition of, the League of Nations.

It is possible that another reason, from their point of view, for avoiding anything in the nature of an entangling arrangement with Great Britain, is the question of their internal prestige, but this is quite questionable, for public opinion counts for little in Turkey.

In any case, it seems to be more likely than not that the present negotiations will come to nothing, or they may drag on indefinitely, although general feeling may be otherwise.

A factor which I am unable to take into consideration, of course, is the value and the attraction to the Turks of the maximum concessions we are disposed to make. I do not think they are in a mood to accept financial help, although they need it badly enough, and it would be hard

for them to refuse it. A participation in the oil rights is such an indeterminate advantage, both from their point of view and from our own. The great difficulty appears to be the strategic importance to each side of the Mosul highlands, and it seems clear that, for the sake of Iraq and the Persian Gulf and India, we cannot possibly give way, for it is not only Turkey, but Russia, we have to deal with.

It is probable that there was a moment, some months ago, when the Turks would have been disposed to come to some comprehensive arrangement with us with which we could have forestalled the Russians, but our attitude was, and correctly so, that as the matter was *sub judice*, it was not the moment for direct negotiations. Time will show more clearly whether or not we missed a great opportunity then.

In any case, the situation seems to be sufficiently complicated and delicate now, for the Russian treaty has limited our scope of action. If our Government succeeds in eliminating the Turkish menace of Mosul, or even in reducing it to a very slight risk, it will be a great attainment.

THE STATE OF CHINA AT THE CLOSE OF 1925

A SUMMARY OF THE SITUATION.

IN the November number of the JOURNAL there appeared an appreciation of the Chinese situation from the well-informed pen of "A Shanghai Trader." It was shown therein how the growth of anti-foreign feeling had arisen and come to a head at Shanghai. The further and more intense spread of the anti-foreign and communistic tendencies throughout the rest of China now overshadows the original outbreak that took place at Shanghai. For several reasons, however, there exists no easy method of putting forward the facts of the present situation in China. In the first place, China is such a gigantic country as to lack any real political cohesion in the European sense of the term. Secondly, there exists no stable or competent central government whose actions are independent and consecutive. Thirdly, the situation is greatly complicated by periodic outbreaks of a civil war, the chances and changes of which appear somewhat baffling to the Western comprehension. It is, consequently only possible to give any summary of the existing Chinese situation in the form of individual paragraphs that observe a rough chronological system.

(1) *Anti-foreign Feeling in the Summer of 1925.* An analysis of the reports coming from China concerning anti-foreign outbreaks during June leads to the conclusion that the majority of cases of definite acts of violence had been largely inspired by the false reports which reached the various Treaty Ports regarding the events which occurred at Shanghai on 30th May. This policy of spreading false propaganda was, and is doubtless still being pursued, by the extremist sections of the students, although the fact remains that actual acts of violence have ceased. There are probably two reasons for this state of affairs. In the first place, there came to light the willingness of the Powers to enquire into the Shanghai incident, and to confer with the Chinese upon tariff reform and extra-territoriality. Considerable satisfaction had been given by these manifestations of feeling throughout China. Secondly, the level-headed average Chinaman has begun to realize more and more that he will not attain his ends by violent extremist tactics.

But the silent and more effective measure of anti-foreign protest, the trade boycott, remained. To quote a few instances: the ports of Hong Kong, Swatow and Canton were paralysed, even though conditions at Shanghai and Amoy might be said to be improving. In their refusal to trade with Britain and with Japan there is reflected, more than in

any other way, the intensity of their anti-foreign feeling, since the Chinese are well aware of the self-inflicted hardships entailed thereby. Nevertheless, just as the maximum effect of this anti-foreign feeling was felt at the Treaty ports, so in the far-distant inland provinces its outward manifestations remained almost negligible. In Yunnan, for instance, even the extremists decided that little could be done, as Shanghai, where lie their sympathies, was so far distant.

■ The attitude of the Chinese authorities during these disturbances is of some interest. Little could be expected from protests addressed to them through the only channel open to the Powers—the puppet Central Government in Peking—although these authorities undoubtedly sent nominal orders to the provincial governments directing them to maintain order. At the outlying seats of disturbance the demands to restore order by the local Consular authorities were met in widely differing fashions. At Hankow and Chungking, for instance, the local Chinese authorities were notoriously dilatory, while at Canton no representations were of any practical value. At Shanghai, however, the local vassal of Chang Tso Lin was largely responsible for the cessation of intimidatory tactics, and the temporary restoration of law and order in Kiangsu Province was also due, in no small measure, to the moderate policy of the Marshal. When Shanghai changed hands in the autumn, General Sun Chuan Fen continued a similar policy.

During the latter part of 1925 the British import and export trade in China lapsed into a state of stagnation, and is likely to remain in that condition until the individual Chinaman realizes that Great Britain seeks only to trade in an open market. In purely British territory, Hong Kong, the Chinese merchants and bankers have been as hardly hit as the British merchant firms. Even so, it would not be correct to say that the trade of China is equally stagnant; the silk exports of Hankow, for instance, are being handled in considerable quantity for trans-shipment to Chinese vessels at Shanghai; Canton admits foreign vessels other than British and Japanese which do not trans-ship at Hong Kong, and local Chinese shipping companies are enjoying a period of unprecedented prosperity.

(2) *The Communist Government at Canton.* The City of Canton has fallen into the hands of a local communistic government which did not, and for the present at any rate, will not, acknowledge the Central Government at Peking. The virtual dictator of this régime is Chang Kai-shek, who commands the Whampoa Military Academy in a suburb of the city. This military school has been in existence for about a year, funds and instructors being provided from Soviet Russia. It is important to note that this school is a Soviet organization as distinct from the Russian unit in Chang Tso Lin's army, which is made up of individual adventurers, mostly "White" Russians. At Chang Kai-shek's right hand sits Borodin, a Soviet emissary.

There is no doubt that the main aim of this administration of Canton became the financial and economic ruin of the British Colony at Hong Kong. It is equally certain that the Central Chinese Government at Peking is not in favour of the rebel Government of Canton, nor does it support its manifest aim. On the other hand, the Central Government is powerless to act directly against Canton. South China, however, is not without its quota of anti-Communist forces, and signs have not been wanting of a military offensive against Canton based on Swatow and financed in part by the Central Government, but the moral of the Russian-trained Whampoa cadets is good, and their dissemination throughout the Communist units is likely to have increased the fighting value of the forces.

(3) *The Recrudescence of Civil War.*—In October the judicial enquiry into the riots at Shanghai was held and the tariff conference assembled at Peking, whilst it was thought that the commission on extra territorial rights would assemble before the end of the year. The tangled state of Chinese politics did not give much encouragement as to the results that would accrue from these negotiations. But any favourable prospects were further jeopardised by the threats of a fresh outbreak of civil war.

General Sun Chuan Fen, a supporter of Wu, was reported to be preparing to advance from the north on Nanking with 40,000 men. Nanking, an important port on the Yangtze, is of further strategic importance owing to its position at the break in the Peking—Shanghai railway. The Nanking area was in the hands of Yang-yu-ting, a vassal of Chang Tso Lin's, who had 20,000 troops, supported by a further 80,000, between Nanking and Tientsin. Sun's move on Nanking seemed to be preliminary to the invasion of the province of Shansi. Shansi is sometimes termed the "model province"; its Governor is both honest and able. The fact that Feng was also said to be contemplating a move into Shansi gave rise to reports that Wu and Feng were acting in concert. Be that as it may, Chang, a stout upholder of the integrity of Shansi, seemed likely to contest the issue.

The Peking Government thereupon put out an appeal for peace, seemingly inspired by a genuine wish that the Shanghai Enquiry and the Peking Tariff Conference should be conducted in a relatively calm atmosphere. The appeal was addressed to Chang and to Feng, but not to the long-dormant Wu. It appeared as though Wu felt that Chang and Feng would undoubtedly have to have a say in anything that turned out to the benefit of China at the Tariff Conference and that their pockets must profit thereby. Consequently, he, Wu, wished to test his power and make a bid for representation at Peking. The Peking Government obviously would have little to do with the communistic administration of Canton; the mandate was not addressed to that body.

(4) *The Central Government.*—At this juncture it is as well to recapitulate the events which led to the constitution of the Central Government and to discuss its influence and power throughout China.

When Feng deserted Wu in November, 1924, and brought about a *coup d'état* in Peking, Chang defeated Wu and weakened his position. The two military powers in the land were now Feng and Chang. Feng selected Tuan Chi-Jui, as being a suitably weak man, to carry on a temporary administration in Peking until such time as a re-united China should establish a definite constitution. Meanwhile, Feng could exploit Tuan's weakness to fill his own pockets. Tuan, however, was alive to the situation and would not take office without the support of the strongest military leader in North China, namely, Chang. So, acting on the belief that half the plunder would be better than none, Feng reluctantly invited Chang to support Tuan. In the end both Chang and Feng accompanied Tuan to Peking on 24th November, 1924. On that day Tuan assumed office as head of a *Provisional Chief Executive*.

By mutual consent Chang was then appointed guardian of the North-East frontier of China, and Feng guardian of the North-West frontier. This meant that each could appoint his own nominees within his own "sphere of influence"; so the situation arose whereby Feng's soldiers occupy Peking, and Feng "squeezed" Tuan until the point would be reached which offended Chang. The latter stood in the position of being strong enough to have the final word. Tuan retained office simply because no one else would accept it on the same terms.

For the time being, therefore, the Powers have had to recognise the Central Government at Peking as the only form of government representative of the country.

(5) *The Events in Shantung during October.*—About the middle of October, Generals Sun Chuan Fen and Hsieh-hung-shun, declared emissaries of Wu Pei Fu, marched on Shanghai. Chang's troops stationed there retired northwards without fighting, and the Chinese portion of the port of Shanghai fell into Wu's hands—a valuable acquisition.

On 21st October, Wu arrived at Hankow, and declared himself as Commander-in-Chief of the allied armies of Hupeh, Hunan, Anhwei, Chekiang, Kiangsu and nine other central provinces. He next pronounced his policy to be directed against the actual Peking Government, and declared that the mass of the people in China would not adhere to any agreement arrived at during the Tariff Conference, at present sitting at Peking.

Meanwhile, Chang Tso Lin's southern army, 100,000 well-armed troops with proved leanings towards law and order, remained along the Pukow-Tientsin railway between Suchow and Tientsin, with the bulk of its strength to the north. Chang's chief of staff, an able Japanese-trained General, called Yang-yu-ting, was in command, and his headquarters were reported to have been moved forwards from Tientsin to Suchow.

So the future seemed to depend upon Wu Pei Fu. Would he remain satisfied with his newly gained status, or would he elect to march against Peking? In the latter event Chang Tso Lin would be forced to fight, in which case it seemed as though he ought to defeat Wu. Feng seemed inclined to wait and throw in his lot with the victor. On the other hand, it was thought that Chang might after all abandon party strife and retire into Manchuria where he believed himself to be safe from molestation.

(6) *The Position in Canton.*—The main strength of the Canton (Red) Government's Army lay in the Russian-trained and well-armed Whampoa contingent, 9,000 strong. Against them stood the anti-red force under Chen, based upon Swatow, consisting of some 30,000 indifferently armed and equipped troops. It would have been greatly in the British interest that Chen should march on Canton; but he was a poor leader and his force lacked efficiency and co-ordination. Swatow shortly afterwards fell once more into the hands of the Canton Government Armies. During this period the waterway between Canton and Hong Kong is believed to have been mined by the Canton Government, about the Bocca Tigris narrows. This action was a counter to the arrival at Hong Kong of the Chinese naval forces, sent by Peking to co-operate with Chen against Canton. This drastic action only served more completely to sever the commercial link between Canton and Hong Kong, already a very serious blow to British trade.

(7) *The situation at the close of November.*

(a) *In the North.*—The first three weeks of November had shown a general improvement in North China. The rival militarists, Chang and Feng, had met in conference with the Provisional Chief Executive at Peking in order to discuss the threatened advance towards Peking of Wu Pei Fu at the head of the entire military forces of the Yangtze Valley of which he claimed the command (see Section 5 above). As a result, Tuan, as the Provisional Chief Executive, issued a mandate of which the essence was that:—

- (i) Wu should retire to the south of the River Yangtze;
- (ii) Chang should guard the Tientsin-Pukow railway;
- (iii) Feng was to guard the Peking-Hankow railway;
- (iv) Peking itself was to be evacuated by the military representatives of Feng and Chang.

The effect of this mandate was to separate Feng and Chang into spheres mutually agreed upon, whilst it maintained Wu at a safe distance from Peking.

The closing days of the month, however, were marked by happenings and rumours of happenings which assumed the gravest import, not only to China herself but to British and Foreign interests in China. Before the moves necessitated by the mandate could be completed—with the exception of the military evacuation of Peking—a serious mutiny broke

out in the ranks of Chang's Army General Kuo Sung-ling, commanding Chang's 6th Division, near Tientsin, declared against his commander-in-chief. With him there went about 75,000 troops. Temporarily, at all events, Chang had thus lost his military status within the Great Wall.

It was not until the 24th December, under the very walls of Mukden, that Chang scored a decisive victory over his former subordinate, who was captured and beheaded.

Meanwhile Feng occupied both Peking and, at a later date, Tientsin, and secured access to the sea for the first time in his career as an independent Chinese militarist.

(b) *In Central China.*—The temporary rapprochement between Chang and Feng is believed to have considerably discountenanced Wu Pei Fu. But little is known of the latter's activities during the period under review. There is, however, no doubt that he mistimed his coup in marching on Shanghai and under-estimated the powers of his rivals, for he has at no time received the support of the full fourteen provinces to the leadership of which he laid claim in his initial mandates. His vassal in Shanghai succeeded in maintaining a modicum of order without undue effort or bribery. As regards the future, there is every reason to believe that Wu will subordinate his aims to those of Feng, rather than contest the issue, should the latter benefit by Chang's removal from power.

Trade conditions in Shanghai have improved considerably during November. Many Japanese mills have re-opened, and both foreign firms and foreign ships have been able to handle cargoes.

(c) *In the South.*—The Soviet-cum-Chinese administration at Canton spread its sphere of influence considerably, and the Russian representative, Borodin, wasted no time before exploiting the success of the Kwangtung forces at Swatow. In addition to bringing Amoy under the sway of Canton, a move across the Hainan Strait to Hainan Island was contemplated.

While the discussions between Chinese merchants of Canton and Chinese merchants of Hong Kong, as to how the anti-foreign boycott may best be broken, have encouraged the Powers interested, there can be no doubt whatsoever that the avowed policy of the Canton Government—the economic strangulation of the British Colony of Hong Kong—has advanced a step further. Coastal trade between Hong Kong and Swatow and Amoy will be subject to the same restrictions as already exist between Canton and Hong Kong; the Hainan Strait commands the valuable rice import from French Tonkin to Hong Kong.

The two platoons of the 5/2nd Punjabis detached from the Hong Kong Garrison to assist in the defence of Shameen, the foreign concession at Canton, were withdrawn towards the end of November. Commercially, however, the foreign docks and warehouses of Shameen are utterly idle

Assisted, possibly, by the efforts of the Chinese merchants of Canton and Hong Kong, the Canton Government approved the issue of a set of rules governing the resumption of trade with foreign firms. The crucial demand is tantamount to the surrender of extra-territorial rights, in that the foreign firms must use premises in the Chinese city of Canton and have no relations with Shameen whatsoever. It was reported that a few American and Japanese firms have accepted these conditions.

(8) *Summary*.—It is impossible to forecast the future in China in so far as it affects foreign interests. At first sight, some hope might seem to lie in the fact that North and South China would then come under the control of one head, Feng, and that, since the central block, under Wu, would not be likely to constitute a serious opposition, an administration might be set up in Peking which might fairly be said to be representative of all China. But when it is realised that such an administration is based upon Soviet support and Soviet principles, the fallacy of such hope is clearly revealed. The Soviet policy in China has been openly declared and freely practised at Canton. A set of circumstances which would leave the Soviet as the predominant power in Peking and Shanghai, as well as in Canton, can only prove disastrous to British interests in China. A Sovietized Peking Government will not be satisfied with the grant to China of tariff autonomy, or with a mere round table discussion on the rendition of extra-territorial rights by which Russia herself does not benefit to-day.

Japan has given a definite indication that she will not allow civil war in China to interfere with her treaty rights in Manchuria. When Mukden was threatened with sabotage at the end of December, Japan reinforced the Liaotung Peninsular garrison by six battalions of infantry and certain artillery units drawn from the homeland and from Korea. These troops have now been withdrawn, but Japan's ready action shows the extent to which she is prepared to go to secure her own nationals on the Asiatic mainland and their property.

SOME PERSONALITIES IN CHINA TO-DAY.

TUAN CHI-JUI.—The so-called government of China to-day is vested in the person of Tuan Chi-Jui, whose title is that of Provisional Chief Executive, and who sits at the head of a provisional cabinet in Peking. Tuan assumed office in November, 1924, at the invitation of the two rival marshals, Feng and Chang; events have proved that he has pleased neither. His policy on taking office was the reformation of the political life of China, but the only visible sign of this has been the passing of a Bill for the establishment of a provisional Senate representative of all provinces, military leaders and legal associations; this Bill had neither Manchurian nor south-western support, and is not likely to be productive of much good.

Tuan is of the Anfu party, and politically should have no difficulty in reconciling his aims with those of Chang Tso Lin. Before Sun Yat Sen died, however, the support of the strong Kuo Min Tung party to the provisional government was withdrawn.

Faced as he is by strong disaffected parties on all sides, it is little wonder that Tuan cannot carry out satisfactory negotiations with the Powers in Peking. He and his cabinet may be likened to a shuttlecock tossed about between the various strong forces operating in China to-day. His decrees, accepted in some provinces and rejected in others, here approved by a provincial civil governor only to be refused by the local military representative, only serve to accentuate the difficulties facing the representatives of the Powers, individually or as a whole, in their endeavours to secure protection for their several nationals in China.

At the end of 1925 a new cabinet was formed under the premiership of Hsu Shib-Ying, most of the members were Feng's erstwhile followers. Tuan retains his nominal title.

CHANG TSO LIN.—Chang Tso Lin reigns virtually as an independent ruler at Mukden, his domain consisting of the provinces of Fengtien, Heilungchiang and Kirin. His rule is fair, his provinces are relatively peaceful and prosperous, and there is a marked air of stability about the territory he occupies.

His armies at the close of 1925 did not total more than 70,000, but the men are well paid and well equipped, and include a small White Russian contingent 700 to 900 strong. To supply the army's needs he has established a first-class arsenal at Mukden with European overseers. At times he has purchased as many as 200 aeroplanes, mostly Breguets, but probably only about fifty are in fighting condition; the Chinaman is not an aviator by nature, and the Russian instructors are not of the highest calibre.

Chang is a fierce opponent of communism and a strong adversary of Soviet activities in Manchuria. He is probably less anti-foreign than any other leading power in China, and he respects foreign property. During the recent troubles in Shanghai he offered to quash all serious agitation there. It was no vain boast, for his army in numbers and equipment is far the strongest force in China to-day. His "price" was recognition, beyond any other Chinese leader, by the Powers.

Marshal Chang is more prominent as an administrator than as a military commander. Fifty-two years of age, he is an irascible little man, with strong personality and character. Credulous and sceptical, though not without dignity and common sense, Chang is an interesting study. If he fails eventually to govern North China, it will be because he lacks an ideal; he appears to have the means to do much, but to have no end for which to strive. His name is respected and even dreaded by Chinese in the whole of North China. The future may show Chang as

military victor down to the Yangtse. A Manchu, and therefore a royalist, he would probably be well advised to replace the Manchu boy-Emperor on the throne.

However, Chang is a rich man with all his riches around him in Mukden and with no love for the political strife of Peking. The temptation to retire from public affairs and to remain in Manchuria may prove too much for him. Should he do so, those Powers with great interests in China will lose the co-operation of a powerful and moderate man.

FENG YU-HSIANG.—Theoretically, Feng—or the Christian General, as he is usually called—shares with Chang the appointment of G.O.C., Frontier Forces; Feng taking the sector to the north-west of Peking and Chang that to the north-east. Actually, Feng represents the military power behind the so-called provisional government in Peking, and has the strong Kuo Min Tang forces in South China at his disposal; he was the chief agent in the setting up of Tuan Chi-Jui.

Feng maintains an army of some 75,000 well-disciplined and well-drilled men, with headquarters at Kalgan, some 100 miles north-west of Peking, and his troops now occupy Peking and Tientsin. Discipline and ceremonial drill are possibly the strongest features of Feng's army, which is relatively weak in numbers, arms and munitions. An attempt has been made to establish an arsenal in Kalgan, and munitions have been purchased from Russia and brought by light car from the Trans-Siberian Railway via Urga. This avenue of supply, is, however, very difficult to operate; the track is more suitable for camels than for mechanical transport, seven days are occupied in transit, and the road is closed by snow for seven months out of the year.

Feng is forty-five years of age, and is a relatively good soldier with a considerable reputation. In stature he is 6 feet 2 inches, exceptionally tall for a Chinese. He is an ardent patriot, a devout Methodist, as well as a strict teetotaler and non-smoker. It speaks well for his personal character that he has been able to persuade his entourage to adopt his example.

Recent events in China have served to emphasise Feng's anti-foreign characteristics, and he took advantage of the trend of events to promulgate many fiery declarations. In spite of this, he is invariably courteous to foreigners.

WU PEI FU.—Wu is fifty-two years of age and has been an *officier, de carrière* since 1898, serving with distinction in the old national army. He became a popular hero in 1920 when he overthrew the Anfu clique, the corrupt pro-Japanese Peking Government, which included Tuan Chi-Jui (the present chief executive) and "Little Hsu" (who visited Europe this spring and was assassinated in China recently).

In the autumn of 1924, Wu was within an ace of securing military control of the whole of Central and North China when he was foully deserted by Feng, and therefore decisively defeated by Chang between Tientsin and Mukden. (See above).

Wu is a slight man, about 5 feet 5 inches in height. He speaks no English. His main attributes are considerable intelligence, acute perception and a certain determination. Judged by European standards he cannot be rated as either a great military commander or an honest civil administrator; in China, however, his methods and the existing political atmosphere cause him to stand out as a big man in every sense except the physical. He has never betrayed an ally.

Wu Pei Fu has proved himself to be striving for no ideal beyond personal aggrandisement and enrichment. In Power at Peking, he would show no consideration for the citizens of China, and in this light is inferior to Chang Tso-Lin.

GERMANY'S POST-WAR ARMY AND PATRIOTIC ASSOCIATIONS.

(Reproduced by permission of the General Staff).

THE article reproduced below, appeared in the *Vossische Zeitung* of 16th September, 1925, and provides an insight into the spirit and training of Germany's new professional army.

In the years before the war, manœuvres were looked upon by certain sections of society as a social event. The military accomplishments of the old army were accepted as a matter of course, the knowledge of which was common property, due to the fact that there was no family, of which the male members could not form a fairly correct impression of the army from their own military service. In comparison, our present 100,000 man army is scarcely noticeable. What does the man in the street know to-day of the life and work of the 'Reichswehr'? The annual autumn manœuvres are, therefore, not only important for the troops themselves, but especially interesting for the public, which has thus an opportunity to come into touch with the 'Reichswehr' and form an estimate of its military value.

"The first essential, to which the observer's attention is attracted, is the striking difference between the other ranks of the old army and those of the present 'Reichswehr.' The sleepy 'Musketier Katschmark,' formerly the popular character of the comic papers, has vanished. The 'Reichswehr' soldier of to-day regards his military profession as a profession, and takes a livelier and deeper interest in his work. This is shown by the relations existing between the officers and men. A form of respect, full of confidence, which regards the superior as an older and more experienced person, has replaced the former system of heel-clicking and senseless discipline, when any question was considered a crime against the Holy Ghost. The fact alone that the period of training for cadets has been extended to at least four years, prevents the occurrence of the unpleasant scene, common enough during the war, of a youthful regular subaltern leading a party of grey-haired reservists. Further, the social position of the officer is by no means enviable, so that he too, is more in sympathy with his men.

"Military training and education is based upon this foundation. This would have been well-nigh impossible with the troops of the old army. It demands, in the first place, that the man's mind keeps active. One can almost say, that in the modern method of warfare, even the most junior private must know the aims of the higher command. Modern infantry tactics, which at first sight create an impression of disorder to the onlooker, all line and mass formation being carefully avoided, require men who are able to take advantage of every bit of cover, and who are capable of arriving at the objective even when all touch has been lost with comrades and headquarters. The reason for these tactics—successive waves in extended order (lose 'Tiefenstaffelung')—is to offer the opponent as unfavourable a target as possible. Experience shows that in this form of attack—as much as twenty metres and more separates individuals—the losses inflicted upon the

attackers by enemy machine guns and barrage fire are reduced to a minimum, as comparatively few of the advancing troops are simultaneously under fire.

"Every soldier of the 'Reichswehr' receives this very complicated infantry training. The numerous cavalry units, therefore, possess a military value which is only increased by their greater mobility. The extraordinary effects obtainable through the 'Reichswehr' is amazing. The speed with which the cavalry operates combined with the infantry tactics it employs, gives every important flanking movement an impetus, which could not be observed even during the war, since the cavalry divisions ('Kavallerieschützendivisionen') had given up their horses. For reconnaissance work, too, the cavalry cannot be dispensed with. Owing to the night marches which are the rule to-day amongst the troops, aerial reconnoitring is a very problematical affair, and in a region where the observation is bad, only the close reconnaissance of mounted patrols can have any real value for general headquarters.

"In attempting to estimate the actual military value of our 'Reichswehr' it must not be forgotten that, apart from the aerial arm, other important auxiliaries are also lacking, of these, with the exception of heavy artillery, tanks and gas are the most important. Both of these arms, however, can be employed most effectively against permanent positions only. An extremely mobile force, which is not compelled to occupy a fixed position, can avoid an attack made by massed tanks, and in the case of gas, experience proves that this can, under certain circumstances, obstruct the operations of those employing it. For, before the attacker has had time to advance across the sector which he has gassed, the defender can generally withdraw and reform in the rear.

"Our 'Reichswehr' has adapted itself to these tactics of extreme mobility which have arisen out of circumstances. It hereby obtains a value which is not commensurate with its actual numbers. It is naturally not in a position to attack a stronger opponent equipped with the most modern technical devices but it will certainly fulfil its task as a frontier guard against an enemy, greater in strength, in a satisfactory manner."

PATRIOTIC ASSOCIATIONS.

The sudden growth of the patriotic associations in 1919 was directly in proportion to the occurrence of German internal and external crises, and as each new crisis arose a batch of associations arose to deal with it.

In like manner the increasing stability of German internal and external affairs is at present having a proportionate effect on the state of the associations. The disappearance of the Rhenish and Bavarian Separatist movements, the evacuation of the Ruhr and "sanctions" areas, and the anticipated evacuation of the Northern zone, have robbed the associations of many of their *raison d'être*. The defeat of the Socialist Government has deprived them of an opponent to fight against, and the coming into power of a government with strong Nationalistic influence has relegated them to the position of followers, with the result that there is less enthusiasm in their ranks. Great hopes were set on the election of Hindenberg, which, it was considered, would increase their influence on politics. These hopes have not been fulfilled. Hindenburg has kept himself carefully aloof from the associations, and politics are being influenced by "Right" politicians of more sober and mature views.

The Disarmament Note created a flutter amongst the associations. It was considered that it would force the dissolution of many of them, and they immediately made preparations to adopt the disguise of athletic associations.

Speeches of Hindenburg and Dr. Gessler (the Minister of Defence), and official instructions on the question of athletics have, in addition to the expected consequences of the Disarmament Note, induced the associations to turn their attention towards athletics. Some of them have formed athletic associations within their own framework, others are insisting on their members joining other athletic associations such as the "Deutscher Turnerbund 1919" and the "Deutsche Turnerschaft."

The "Jungdeutschlandbund," "Wehrwolf" and N.S.D.A.P. are arranging athletic and flying courses at special camps. There appears to be no lack of candidates for these courses.

Consequent on the Disarmament Note, the open assistance of the "Reichswehr" units in the matter of the loan of arms, ranges and instructors has been withdrawn, though it is probable that close touch is still maintained between the "Reichswehrministerium" and the associations. On this account, any exercises which are being carried out by the patriotic associations have had to be somewhat curtailed, and fewer "Zeitfreiwilligen" are accepted by the "Reichswehr."

The associations generally are reported not to be at present financially strong. The causes for this are the following:—

- (a) The reduced subscriptions from industrialists owing to the present lack of credit. Further, the failure of the Stinnes concern, which formerly supplied considerable funds, has had no small effect on the financial resources of the associations.
- (b) Now that a Government of Nationalistic tendency is in power and conditions have become more stable, the uses to which associations could be put in cases of internal emergency have been lessened, and consequently subscriptions have not been continued.

For certain specific purposes, such as the organisation of athletic and flying courses, there appears, however, to be no lack of funds.

CORRESPONDENCE.

[Correspondence is invited on subjects which have been dealt with in the JOURNAL, or which are of general interest to the Services. Correspondents are requested to put their views as concisely as possible, and publication of letters will be dependent on the space available in each number of the JOURNAL.—ED.]

CHARTING OF THE UPPER AIR.

TO THE EDITOR OF THE R.U.S.I. JOURNAL.

SIR,—In the November number, Commander L. G. Garbett, states that "information concerning weather conditions is again a necessity, but now not only on the surface but in the upper layers of the atmosphere as well." This because "to the navigator of the air it is vital." To obtain this he says that in the last twenty years "systematic observations of the upper winds over the land" have been made, "and as a result we can form an idea of the circulation of the atmosphere up to high levels over the Continents, but the knowledge is incomplete without more observations over the sea."

I would like to ask him, is this information as to the circulation of the atmosphere over the Continents authoritative? I have never heard of any publication concerning it.

Commander Garbett says that "complete charts of the mean winds at different layers are absolutely necessary." I would ask him, are they obtainable, and if they are, will not the cost of ascertainment and transmission be prohibitive of commercial air navigation?

We know that in the surface layer of the atmosphere there is no real stability so far as air navigation is concerned, from day to day or from hour to hour, even in that most stable of all winds, the trades, as I well know by the handling of such rough and ready instruments as masts, yards and sails in the many times I have crossed them. It must be borne in mind that, the stability required for successful air navigation is much greater than that required for a sailing ship, and if there is no real stability in the lower strata how is it possible it can be found in the upper strata where the factors of density, temperature (which besides fluctuations due to changes, decreases 1° F. for every rise of 300 ft.), and electricity, are so much more pronounced?

If there is no real stability how is it possible to provide sufficiently stable charts, and even if they could be provided, of what value would they be if aerial navigation is to be controlled by W/T from a ramification of stations all over the earth, giving the navigator directions to go round every pocket, disturbance or electrical storm that was likely to be encountered? It does not seem to be apprehended what a detriment to navigation this would be and how much the provision of fuel for this necessity would reduce the amount of disposable load.

The balloon observations by which it is proposed to obtain stable charts from unstable conditions are fine weather instruments, and cannot be used in cloudy, thick or bad weather. For all matters connected with the air it must be recol-

lected we are dealing with a light gas not a fluid, and that comparisons with the sea are irrelevant.

Yours, etc.,

W. H. HENDERSON,
Admiral (Retired).

PROMOTION BY MERIT IN THE ARMY¹

TO THE EDITOR OF THE R.U.S.I. JOURNAL.

SIR,—Lieutenant Foster's scheme is open to several objections which he does not mention :—

(1) Dissatisfaction with the present system is due less to the fact that brilliant officers are held back than to the fact that promotion is too slow all round. The advantage of decreasing the age of the senior officers would be counterbalanced by increasing the age of the junior officers.

(2) If a captain of twelve or a lieutenant of seven years service is not fit for promotion he is not fit for his position. If he is fit for promotion he has a legitimate grievance if he is not promoted in his turn.

(3) Lieutenant Foster speaks of "friendly competition" for promotion among officers of the same regiment. It is more probable that the happy families which all regiments should be, and most regiments are, would be turned into nests of jealousy and suspicion.

(4) There are few officers of energy and spirit who would willingly serve under an officer of the same regiment who had been promoted over their heads. If financially able to retire they would probably do so, leaving to the lazy and spiritless their share of promotion by seniority.

(5) Many officers marry on the presumption that they will be able to retire at least on a major's pension. These will be thrown into a state of uncertainty and discontent.

(6) Lieutenant Foster proposes to test the efficiency of officers by placing them in command of other units for a month or so. Such a practice would interfere with the training of these units and would probably be resented by all ranks.

(7) It is undesirable to make examinations for promotion very difficult. Many efficient officers are bad at examinations, which are now used less as a test of efficiency than as a means of compelling officers to study their text books.

(8) The position of a C.O. would become extremely invidious. Most of his officers would be men who had been passed over on the strength of his report, and he would be unable to enter the Mess without meeting the black looks of those who thought he had treated them unfairly, or the eager glances of those who hoped to curry favour with him.

There are various methods of accelerating promotion :—

(1) Periodical elimination of the least fit in each rank.

(2) Offering bounties to those willing to retire.

(3) Decreasing the establishment of the junior ranks.

(4) Giving a proportion of commissions to senior N.C.Os.

There are no doubt objections to all these methods, but the objections are probably less serious than those of Lieutenant Foster's scheme.

Yours, etc.,

RAGLAN.

¹See "Promotion by Merit in the Army," *R.U.S.I. Journal*, November, 1925, p. 685; also "Promotion by Rejection in the Army," p. 52, of this number.

OLD MILITARY CUSTOMS.

TO THE EDITOR OF THE R.U.S.I. JOURNAL.

SIR,—In his letter to the R.U.S.I. JOURNAL last November, Colonel Maisey alluded to the tune played at military funerals as "point of war." Strictly speaking, it should be a "point of war," for "point of war" is the archaic term for signals given, in the Army, by bugles, drums or other instruments. Every bugle call, down to the Defaulters' Horn, is a point of war.

In the New English Dictionary we find:—

Point. Mus. A short strain or snatch of melody; esp. in phr. point of war, &c., a short phrase sounded on an instrument as a signal. Arch. Shaks. 2 Hen. IV, iv, i, 52. 1602 Marston, Ant. & Mel. IV. Wks. 1856 I. 48, Make me a straine; . . . Breathe me a point that may inforce me weepe. 1814 Scott Wav. xlv, to perform the beautiful and wild point of war. 1867 Morris, Jason i, 127, his guardian drew the horn from off his neck and thereon blew a point of hunting known to two or three. 1871 Ruskin Fors. Clav. viii. (1896) I. 152, Bid him put ghostly trump to lip and breathe a point of war."

The point of war referred to in the above quotation from "Waverley" was the "retreat, or watch-setting." In Macaulay's "Ivry," we read, "then on the ground, while trumpets sound their loudest point of war, fling the red shreds, a foot-cloth meet for Henry of Navarre," and in Scott's Legend of "Montrose," ch. III, Captain Dalgetty says: "they havena sae mickle as a German whistle, or a drum to beat a march, an alarm, a charge, a retreat, a reveillé, or the tattoo, or any other point of war."

"War" is used as equivalent to "army" or "service," as in the phrase "War Office," "Secretary of State for War," where it is equivalent to "Army." In the oath taken at a Court Martial under the Indian Army Act the old expression is still used ". . . and if any doubt shall arise, then according to my conscience the best of my understanding, and the custom of war in the like cases," i.e., the custom of the Service.

Macaulay uses the word "battle" in a similar manner in the "Battle of the Lake Regillus:" "Behind them Rome's long battle came rolling on the foe, Ensigns dancing wild above, blades all in line below."

Yours, etc.,

N. A. R. BUDD.

NAVY NOTES

GREAT BRITAIN.

FLEET AND DOCKYARD ECONOMIES.

Further changes have been announced since the last issue of the JOURNAL making for reductions in naval expenditure, to offset the cost of the rebuilding programme adopted by the Government in July. The chief measures in this direction recorded last quarter were the scrapping of destroyer depot-ships and old cruisers and destroyers; the closing of the dockyards at Rosyth and Pembroke; and reductions in the pay of future junior officers and new entries. The further measures are mainly concerned with the sea-going Fleets at Home and in the Mediterranean, and with the small craft used for training purposes at the ports. On October 27th, the Admiralty notified that the complements of H.M. ships have been under consideration, and some reductions have been effected therein. Other changes were made at the same time, as follows:—

SUBMARINES.—All the "K" class submarines, with the exception of "K 26," are to be scrapped, the First Submarine Flotilla being reconstituted with "K 26" and four "L" class submarines.

HARBOUR ESTABLISHMENTS.—Reductions in the number of tenders attached to Harbour Training Establishments at the home ports are to be effected as follows:—

Portsmouth.—H.M.S. "Rob Roy" and H.M.S. "Sable" to be withdrawn from H.M.S. "Vernon." H.M.S. "Derwent" and H.M.S. "Itchen" (trawlers) are also to be withdrawn from H.M.S. "Vernon" and placed on the sale list. H.M. Submarines "H 21" and "G 4" to be withdrawn from H.M.S. "Dolphin" and placed on the sale list. H.M. Monitor "M 33" to be withdrawn from H.M.S. "Vernon" and placed in reserve. H.M.S. "Southdown" to be withdrawn from H.M.S. "Excellent" and sold.

Devonport.—H.M.S. "Wakeful" to be withdrawn from H.M.S. "Defiance." H.M.S. "Sturgeon" to be withdrawn from the R.N. College, Dartmouth, and to be replaced by H.M.S. "Forres" from the Boys' Training Establishment, without relief. H.M.S. "Tenacious" to be withdrawn from the gunnery school and the duties undertaken by H.M.S. "Saumarez," in addition to her present duties as tender to the Royal Naval Engineering College, Keyham. H.M.S. "Saumarez" will in future be tender to H.M.S. "Impregnable" instead of tender to H.M.S. "Vivid." H.M.S. "Flintshire" to be withdrawn from the gunnery school; the duties to be undertaken by H.M.S. "Tedworth," in addition to her present duties. The disposal of H.M.S. "Flintshire" is under consideration. H.M.S. "Iridescence" to be withdrawn from the Third Submarine Flotilla and sold.

Nore.—H.M.S. "Tring" to be withdrawn from the Boys Training Establishment at Shotley and placed in reserve. Only one emergency destroyer will be maintained at the Nore in future, H.M.S. "Stork" being regularly utilised as a second emergency destroyer, in addition to her present duties as tender to the Gunnery School.

SPECIAL RESERVES.—The Special Reserve of Engineer Officers will be abolished, and the Special Reserve of Royal Marine Officers is to be reduced.

SECOND CRUISER SQUADRON.—The Second Cruiser Squadron will be reduced by H.M.S. "Calliope," which will be placed in reserve and one of the Destroyer Flotillas attached to the Atlantic Fleet will be reduced to reserve.

ATLANTIC FLEET AS A TRAINING SQUADRON.—On November 4th the Admiralty further announced that it had been decided to reduce the four "Iron Duke" class battleships from full commission to a special complement, and to employ them under the orders of the Commander-in-Chief, Atlantic Fleet, in training boys at sea. Consequent on this decision, the following re-distribution of battleships was approved to take place in the spring of 1926 :—From the Atlantic Fleet to the Mediterranean, H.M. ships "Resolution" and "Royal Oak"; from the Mediterranean to the Atlantic Fleet, H.M. ships, "Iron Duke," "Marlborough," "Emperor of India" and "Benbow."

RE-ORGANISATION OF BATTLE SQUADRONS.

The composition of the three Battle Squadrons on the completion of these transfers will be as follows :—

MEDITERRANEAN.

First Battle Squadron.—H.M. ships "Queen Elizabeth," "Barham," "Malaya," "Valiant" (to be relieved by "Warspite," "Resolution" and "Royal Oak.")

ATLANTIC FLEET.

Second Battle Squadron.—"Revenge," "Ramillies," "Royal Sovereign."

Third Battle Squadron.—"Iron Duke," "Marlborough," "Emperor of India" and "Benbow." The present Rear-Admiral, Second Battle Squadron, will be transferred to H.M.S. "Iron Duke," and will take command of the Third Battle Squadron on its transfer to the Atlantic Fleet.

REPLIES TO ATTACKS ON ADMIRALTY.

ROSYTH AND PEMBROKE.—The proposal made public on September 2nd to reduce Pembroke and Rosyth Dockyards to a care-and-maintenance basis was discussed in the House of Commons on December 11th, when Mr. W. Adamson moved that the decision "was taken without due regard to the Government's responsibilities to Parliament, to the municipalities concerned, and to the workmen affected." He advanced the claims of Rosyth, and Lieut.-Colonel Watts Morgan, supported by Mr. Lloyd George, did the same for Pembroke. Mr. Bridgeman, replying for the Admiralty and the Government, said that if we could do in four dockyards the work formerly done in six, that was an obvious economy which ought to be made. The action of the Admiralty was taken directly as a result of the decision of Parliament on July 29th, to adopt the new programme of construction, when the Admiralty undertook to look in other directions for economies which would go some way to meet the extra expenditure. It had been stated, said the First Lord, that this was the only economy contemplated by the Admiralty. One economy must come first, and this happened to be the first and most obvious, but very much larger economies were contemplated which would fall more heavily on the people in England than on Scotland or Wales. Commander Bellairs moved

an amendment that the decision of the Admiralty was "in accordance with the policy of economy approved by the House and announced in the Gracious Speech from the Throne," and this motion was carried by 237 votes to 65, a majority of 172.

FIRST LORD'S SPEECH.—Mr. Bridgeman, in a speech at Colwyn Bay on October 31st, replied to "the stream of ill-informed and mischievous attacks which have been made in some sections of the Press against the Admiralty." Our expenditure of £60,000,000 this year is equivalent, he said, to about £37,000,000 pre-war, when the last pre-war estimate was £51,000,000. It was not fair that the Admiralty should be singled out as if they were the only department with an increased staff. In other departments there were many instances of much higher increases. Before the war, the Admiralty was notoriously understaffed. We had practically no Naval Staff. If we had had one, many of the disasters in the war could not have occurred. Though the Fleet is smaller, that does not in itself justify a proportionate reduction in staff. The war had been fruitful in the invention of all sorts of new appliances, wireless, mines, great electrical development, anti-aircraft and anti-submarine devices, and many other scientific inventions, which were practically non-existent before, and require an expert staff for management and for research.

FIRST SEA LORD AT GUILDHALL.—A defence of Admiralty policy was also made by Admiral of the Fleet Earl Beatty in replying for "The Navy" at the Lord Mayor's Banquet. It is forgotten, he said, that 1914 was the end of a prolonged period of naval peace, which did not tend to the full development of the capabilities either of the personnel or of the material of the Fleet. It is not the fault of the Admiralty that the impetus of war has added vastly to the complexity of the technique of naval warfare. Lord Beatty asked if any industrial concern or business in the country finds that it can conduct its affairs with the same overhead charges as it incurred in 1914. After referring to the closing of Rosyth and Pembroke, he said that a factor of still greater importance is that the Government, having taken into consideration the international outlook, had authorised some temporary relaxation of the immediate readiness of the Fleet for active service. This recent decision had opened up fields of economy hitherto closed to the Admiralty.

THE FLAG LIST.

PROMOTIONS AND RETIREMENTS.—Chief among the changes on the Flag list of the Royal Navy since the last issue has been the promotion of a new Admiral of the Fleet, to fill the vacancy caused by the retirement of Sir Cecil Burney on completing five years in this grade on the active list. In pursuance of His Majesty's pleasure, Admiral Sir John M. de Robeck, Bart., G.C.B., G.C.M.G., G.C.V.O., has been promoted to be Admiral of the Fleet, with effect from November 24th. Consequently, the following promotions were made from the same date:—Vice-Admiral Sir George P. W. Hope, K.C.B., K.C.M.G., to be Admiral; Rear-Admiral W. S. Nicholson, C.B., to be Vice-Admiral; and Captain G. N. Tomlin, C.M.G., M.V.O., A.D.C., to be Rear-Admiral. Rear-Admiral Tomlin was placed on the retired list at his own request next day, November 25th, whereupon Captain the Hon. Herbert Meade, C.B., C.V.O., D.S.O., A.D.C., was promoted to Rear-Admiral.

The foregoing were the only changes involving promotions to the Flag list during the quarter. The retirement, at his own request, of Admiral Sir William C. M. Nicholson, K.C.B., was announced on October 14th, but in accordance with the decision to reduce the Flag list gradually, no promotion was made in consequence of this retirement.

DEATHS OF FLAG OFFICERS.—The deaths were reported during the quarter of a number of admirals on the retired list. Among them was Admiral Sir Arthur John Henniker-Hughan, Bart., C.B., M.P., who was the senior in rank of the ten officers holding permanent commissions in the Royal Navy who were returned to Parliament at the last election. He died of pneumonia in a London nursing home on October 4th, aged 59.

NEW APPOINTMENTS.—Four appointments of Flag Officers to new commands were promulgated. On October 23rd, it was announced that the King had approved of Vice-Admiral Sir Richard Webb, K.C.M.G., C.B., being President and Flag Officer Commanding the Royal Naval College, Greenwich, in succession to Vice-Admiral Sir George P. W. Hope, K.C.B., K.C.M.G., to date February 27th, 1926. Sir George Hope completes three years at the College on this date.

The selection was announced in December of Vice-Admiral Sir Rudolf W. Bentinck, K.C.M.G., C.B., to be Vice-Admiral Commanding Reserve Fleet, in succession to Vice-Admiral the Hon. Sir Victor A. Stanley, K.C.B., M.V.O., to date March 4th, 1926, when the two-year term of the latter expires. On December 7th, Rear-Admiral C. P. Beaty-Pownall, C.M.G., hoisted his flag as Admiral-Superintendent at Chatham Dockyard, in succession to Rear-Admiral Percy M. R. Royds, C.B., C.M.G., who was also relieved after two years. On December 8th, the Admiralty announced that Rear-Admiral Alexander V. Campbell, C.B., D.S.O., M.V.O., had been selected to be Rear-Admiral in charge and Admiral-Superintendent of Malta Dockyard, in succession to Rear-Admiral Charles D. Johnson, C.B., D.S.O., M.V.O., to date February 1st, 1926. Rear-Admiral Campbell will assume command about March 1st.

On December 12th, the Admiralty stated that the King had appointed Admiral Sir Thomas H. M. Jerram, G.C.M.G., K.C.B., to be Naval Member of the Naval Prize Tribunal, in succession to the late Admiral of the Fleet Sir Doveton Sturdee, G.C.B., K.C.M.G., C.V.O., LL.D. The original members of this Tribunal were Lord Phillimore (Chairman), Sir Guy Fleetwood Wilson, and Admiral of the Fleet Sir George Callaghan. Upon the death of the last-named on November 23rd, 1920, Sir Doveton Sturdee took his place.

PERSONNEL.

SENIOR OFFICERS' TECHNICAL AND WAR COURSES.—The following dates for Senior Officers' Courses in 1926 are promulgated for information:—

Technical Course.

4th January—5th March.
12th April—11th June.
9th August—8th October.
18th October—17th December.

War Course.

8th March—9th July.
11th October—18th February, 1927.

Details of the Technical and War Courses are to be found on page 174 of the Appendix to the Navy List. Applications should be forwarded to the Admiralty through the usual channels, to arrive not later than a month prior to the commencement of the course it is desired to take.

NAVAL STAFF COLLEGE.—The next Staff Course will commence on Tuesday, 14th September, 1926. Applications should be forwarded through the usual channels, to arrive not later than 1st May, 1926.

NEW SCHEME OF CLASSIFICATION OF OFFICERS.—On November 20th the Admiralty announced by Fleet Order that the division of officers into branches was to be abolished, and that in future officers were to be divided into the following "categories":—Executive, engineer, medical, dental, accountant, instructor, chaplain, shipwright, ordnance, electrical, schoolmaster, wardmaster, and Royal Marine. The term "executive officer" will include Gunners, Gunners (T), Boat-swains, Signal Boat-swains, Warrant Telegraphists, Warrant Masters-at-Arms, and officers promoted therefrom, and the officers of the Permanent Cruiser Service. Similarly, the term "engineer officer" will include Warrant Engineers, Warrant Mechanicians, and officers promoted therefrom. All (E) officers will be included in the category "engineer officers." The eligibility to succeed to the command of a ship, and to exercise military command, will be limited to executive officers as defined above, and the special arrangements under which certain (E) officers have hitherto retained this eligibility will now finally cease to exist.

SEPARATE LISTS AND UNIFORM.—It was further provided that all officers qualifying or employed on engineering duties, from Midshipmen upwards, would be shown in separate seniority lists in the Navy List, in the same section as other engineer officers. A corresponding arrangement will also be followed in the retired list. As far as the active officers are concerned, this change was put into effect in the monthly Navy List for December, 1925. (E) officers will also in future be shown under ships and establishments in the Navy List with other engineer officers, in the order in which they take charge in their department. It has also been decided that all (E) officers of the rank of midshipmen and upwards are in future to wear the purple distinction cloth worn by other engineer officers. A more distinctive shade of purple is to be used.

THE QUESTION OF STATUS.—The new order aroused a certain amount of discussion, and an indication of the feeling on the matter in some quarters was given by a manifesto to the Press on December 4th, signed by Lord Weir, Sir Charles Parsons, Sir Archibald Ross, and Sir John E. Thornycroft. Their view was that apparently, without any explanation, the Selborne-Fisher scheme inaugurated twenty-three years ago, under which the status of the engineer officer was fully recognised, has been entirely scrapped. They felt bound "to record the most emphatic protest against a step which appears definitely to relegate the engineer officer of H.M. Navy to the inferior status he held in 1902." The matter was also raised in the House of Commons, and replies to questions were made by the First Lord on December 9th, and the Parliamentary Secretary to the Admiralty on December 16th. The former earnestly deprecated suggestions that the changes imply inferiority in any shape or form, as such is not the opinion or intention of the Admiralty. The latter stated that the Fleet Order made no change in the command which the engineer officer has over his subordinates. The distinction in uniform is purely a matter of practical convenience.

NEW EXECUTIVE LIST COMMITTEE.—On December 9th, the Admiralty announced that a committee had been formed to investigate and report upon the policy to be pursued in future as to the list of executive officers of the Royal Navy. Lord Chelmsford is chairman, and the members are Admiral of the Fleet Sir Charles Madden, Rear-Admiral H. W. Parker, Captain R. C. Dalglish, Sir

Warren Fisher (Permanent Secretary to the Treasury, representing the Treasury), and Sir Charles Walker (Deputy Secretary of the Admiralty). Mr. H. V. Markham, of the Commission and Warrant Branch, will act as Secretary.

PROMOTION ZONES CHANGED.—For the December, 1925, selections, the zones of promotion for executive officers were:—Commanders, $5\frac{1}{2}$ to 8 years' seniority on the date of selection (as before); Lieut.-Commanders, 3 to $6\frac{1}{2}$ years' (instead of $6\frac{1}{2}$ years). For the June, 1926, selections, the zones will be:—Commanders, 5 to $7\frac{1}{2}$ years' seniority; Lieut.-Commanders, $2\frac{1}{2}$ to 6 years. In October, 1925, the Admiralty published the limits of the promotion zones for the half-yearly advancements of commanders in the medical and accountant branches. Surgeon-Commanders must be of 8 years' seniority and over on the date of selection; and Paymaster-Commanders of 12 years' seniority and over.

NAVAL MISSION TO CHILE.—The following officers have been lent to the Chilean Government to advise and assist in technical naval matters:—

Commander W. L. Jackson, D.S.O.

Commander G. H. Creswell, D.S.C.

Lieut.-Commander G. A. Garnons-Williams, D.S.C.

Lieut.-Commander J. A. Bickford-Smith.

REPORTED REDUCTIONS OF CAPTAINS AND COMMANDERS.—Towards the end of October, a report was in circulation that the Admiralty intended at the end of the year to reduce the number of Captains and Commanders on the active list. On the 29th, the Secretary of the Admiralty announced that the rumour was incorrect, as no such proposal had been under the consideration of the Board.

COLONIAL NAVAL A.D.C.'S.—By a new Order in Council dated October 12th, an officer of the Royal Navy or Royal Marines allowed to accept an appointment as Secretary or Aide-de-Camp on the personal staff of the Governor-General or Governor of a British Dominion or Colony, shall not receive half pay or other emoluments from naval funds during the tenure of such appointment. His time, however, may be allowed at the discretion of the Admiralty to count for all purposes as though it were Naval service.

OFFICERS' PAY REVISION.—The Admiralty have issued details of the basis upon which the triennial revisions of officers' pay, according to the cost of living, will be made. The basis will be a comparison between (a) the increased cost of living in July, 1919 (with reference to which the standard rates of pay were fixed), as represented by the figure 107 $\frac{1}{2}$, this being the mean of the increase of cost-of-living figures for that month (105—110) published by the Ministry of Labour; and (b) the average of the corresponding index figures for the six months ending on December 31st preceding the date on which the revision is due to be made. The detachable portion (20 per cent.) of the standard rates affected will be increased or decreased accordingly, the resultant rates being "rounded" for the purpose of avoiding the payment of fractional amounts.

A.R.N.O. CHANGES.—In a circular dated October 24th, 1925, the re-constitution of the Association of Retired Naval Officers, formed originally in 1920, was announced. Replies to a letter of June 9th, 1925, were overwhelmingly in favour of re-organising the A.R.N.O. as a Welfare Association, to help and advise retired Naval and Marine officers, or their widows. The new President is Vice-Admiral Wade Caulfeild.

MATERIAL.

LAUNCH OF THE "RODNEY."—H.R.H. Princess Mary, Viscountess Lascelles performed the naming ceremony at the launch of the battleship "Rodney," at the yard of Messrs. Cammell Laird & Co., Ltd., Birkenhead, on December 17th. The Princess broke a bottle of Imperial wine against the stem of the vessel, named her the "Rodney," and wished her Godspeed. At the luncheon following, which the Princess did not attend, the First Lord said he had heard the battleships "Nelson" and "Rodney" called the cherry-tree class, because they were cut down by Washington. Rear-Admiral Sir Alfred Chatfield, Third Sea Lord, said that the idea that the "Rodney" would be the last battleship that would be built was not the naval view. They believed her to be the first of a great new line, and that many "Nelsons" and "Rodneys" would be built in the future. She was the result of experience during the war. The vessels built before the war had some failings, and after the war they made up their minds to overcome those failings.

CRUISER LAUNCHES.—Cruisers of the 1924 programme are now at the launching stage. February 16th has been fixed for the launch of the "Suffolk" at Portsmouth, by the Marchioness of Bristol. On March 11th, the "Cornwall" is to be launched at Devonport by Lady Clinton. Two cruisers will be put afloat on March 16th, the "Kent" at Chatham, and the "Cumberland" at the Vickers' yard, Barrow, the latter ship being named by the Dowager Countess of Carlisle.

NEW DESTROYERS.—The two destroyers of the 1924 programme were launched in January. On the 14th, the "Ambuscade" was put afloat by Messrs. Yarrow, at Glasgow, and on the 27th the "Amazon" by Messrs. Thornycroft at Southampton. The latter was named by Lady Chatfield, wife of the Third Sea Lord, on the 16th, when frost prevented the vessel leaving the ways.

FUTURE WAR VESSELS.—A speech on the Navy was delivered by Rear-Admiral Sir Alfred Chatfield, at the Cutlers' Feast in Sheffield on October 21st. He said he had spent the last four or five months in visiting naval productive centres. It would be a bad day for the Empire if the plant and the skilled men who designed, built and used it were allowed to decay. Other types of ships might alter or completely vanish, but there was one that would remain—the capital ship. "So long as the water remained," said the Controller, "men would float with the greatest concentration of power that they could support." Air power, he said, had had the effect of pushing sea power into the background. Air power and naval power must march in harness, but it must not be forgotten that our Empire was founded on sea power; on sea power it stood and by sea power alone could it be maintained.

COMPLETION OF THE "EMERALD."—The cruiser "Emerald," laid down in September, 1918, at the Armstrong yard, and taken after her launch to Chatham, was completed there on December 31st, and was commissioned on January 15th, with a full Devonport crew for service in the Fourth Cruiser Squadron, East Indies, in place of the "Colombo."

TRIALS OF THE "ENTERPRISE."—Sister ship to the "Emerald," the "Enterprise," laid down at Clydebank in June, 1918, and transferred to Devonport for completion, was ordered to commission on January 8th for trials with a special Chatham crew as tender to the "Vivid." On her completion about March, 1926, she will proceed to the East Indies to relieve the "Cairo." She is the last of the war-time design cruisers.

SUBMARINES COMPLETING.—Submarine "L 27," completed at Sheerness, was ordered on being finished on January 15th to join the Fifth Submarine Flotilla, Portsmouth. Submarine "L 26," at Devonport, will not be completed until October, 1926. These are the last two of the war design submarines, laid down at Messrs. Vickers, Ltd., in January, 1918. As regards "X 1," the first post-war submarine, it was notified on December 23rd that she is to be regarded as a fully commissioned ship, tender to the "Dolphin," as from September 25th, 1925.

ORGANISATION AND DISTRIBUTION.

SECOND CRUISER SQUADRON REDUCED.—Withdrawn from the Second Cruiser Squadron, Atlantic Fleet, on the ground of economy, as recorded elsewhere, the cruiser "Calliope" was reduced to Reserve Fleet status at Sheerness, as tender to H.M.S. "Ajax," on November 17th. On December 3rd, the vessel was completed to special complement for a trooping trip to the China Station with part of the relief crew of the "Hawkins."

NINTH FLOTILLA DISBANDED.—The destroyer flotilla of the Atlantic Fleet selected for retrenchment under the scheme of economies, was the Ninth Flotilla, maintained with Reserve Fleet complements at Port Edgar. This Flotilla left for its home ports on December 7th, when it was disbanded and the vessels placed under the orders of the V.A.C., Reserve Fleet. Its place was taken by the Seventh Flotilla, which was reduced to Reserve Fleet complement at Port Edgar from full commission.

RHINE FLOTILLA WITHDRAWN.—The Naval Flotilla on the Rhine was ordered to be withdrawn at the end of January. Twelve motor launches left Portsmouth in December, 1918, to form this Flotilla, but since 1922 the strength of the force had been reduced to five—Nos. 291 (S.N.O.), 8, 287, 473 and 542. The Flotilla had been commanded since April, 1925, by Commander P. G. Wodehouse, D.S.O.

DANUBE GUNBOAT WITHDRAWN.—The river gunboat "Glowworm" was withdrawn from service in the Danube in September, 1925, being paid off into reserve at Malta on September 14th. In December, orders were issued that the vessel was to pay off into the charge of the civilian care-and-maintenance party already in charge of her sister ships "Aphis" and "Ladybird" at Malta.

SMALL CRAFT IN CHINA.—It was approved in November for motor launches 307 and 519, sent to the China Station about a year previously to assist in patrol duties on the Yangtse, to be sold in China. The small craft taken up for special duty during the recent disturbed conditions on this station have been paid off and returned to their owners, but the "Faulkner," "Nessus" and "Onslaught" are still commissioned temporarily for special service at Hong Kong.

NAVY OCCURRENCES.

LOSS OF SUBMARINE "M 1."—During exercises early on the morning of 12th November, submarine "M 1," Lieut.-Commander Alec M. Carrie, dived in a position about fifteen miles south of Start Point, and was not seen again. Every effort was made to locate her and establish communication, but the vessel became a total loss with all hands—sixty-nine officers and men, including the captain. She was the first of the three "submarine monitors" of the "M" type, each of which mounted a 12-inch gun, and belonged to the Fifth Submarine Flotilla,

Portsmouth. In October she was one of eight submarines of the Flotilla which visited Antwerp. She completed a refit on 15th June, 1925, with subsequent satisfactory trials, and joined the flotilla on 7th July, since when she had carried out the usual exercises at sea, with no defects to the hull or machinery.

On 21st November it was announced officially that, as a result of an examination of the hull of the steamship "Vidar" at Stockholm, the Admiralty considered that the damage to submarine "M 1" whilst submerged was due to a collision with that vessel. The "Vidar" was put into dry dock at Finnboða on 24th November in the presence of Captain W. de M. Egerton, R.N., naval attaché in Scandinavia, the company's officials, and Admiral Schneider and other officers of the Swedish Navy, when in addition to the damage to the stern, traces of bluish-grey paint were discovered on the ship's bottom. Under the circumstances, it was certain that "M 1" was rapidly and completely flooded, and the crew must have perished immediately.

After the disappearance of the submarine, a number of vessels swept repeatedly in the neighbourhood of the place where she was last seen, and although various obstructions were found, the submarine was not located. An offer of assistance by the German salvage firm of Neufeldt & Kuhnke, of Kiel, which had a special diving apparatus enabling divers to work at a greater depth than the ordinary British apparatus, was accepted, and the destroyer "Wolfhound" made a quick passage to Kiel and back to embark the gear and personnel. The Germans were on the spot and ready to begin their search by the morning of the 16th November, but rough weather interfered with their work, and it was not possible to make the first descent until the night of the 20th, when nothing was found. Next day bad weather again interfered. Although subsequent attempts were made by the German and British divers with commendable courage, the Admiralty announced on 3rd December that diving operations had been discontinued as no positive results had been obtained. It was not considered necessary to prolong the search, as the cause of her loss had been so fully established. The Germans and their plant left Devonport on 4th December for Kiel in H.M.S. "Carstairs."

"HAREBELL" EXPLOSION.—An accident occurred to a 12-pounder gun in H.M.S. "Harebell" during firing practice off Portland on 30th November. Able seaman Clarence E. Pearce was killed, and five officers and men were injured, among them Lieut.-Commander M. C. Despard, who sustained a fracture of the leg. A verdict of "death from misadventure" was returned at the inquest on Pearce.

VISIT TO ANTWERP.—The Fifth Submarine Flotilla from Portsmouth visited Antwerp from October 6th to 9th. It consisted of the "Fermoy" and eight submarines, "H. 27," "H. 31," "H. 43," "H. 48," "L. 22," "L. 23," "M. 1" and "M. 3," under the command of Captain C. G. Brodie. This was said to be the biggest submarine flotilla which had ever entered the Scheldt. The visitors were entertained by the military and civil Governors of the Province of Antwerp, and by the municipality of the town. The Burgomaster of Antwerp, speaking in English, rendered homage to the British Fleet, and especially to the wonderful and heroic work of the submarines in the great war.

ADMIRAL KEYES AND AIRCRAFT.—Admiral Sir Roger Keyes, Commander-in-Chief in the Mediterranean, was slightly injured in October as the result of a mishap while inspecting the aircraft-carrier "Eagle," under seagoing conditions. The machine in which he was flying was obliged to make a forced landing in the sea owing to engine failure, and the Admiral was slightly shaken and bruised.

THE FLEET AIR ARM.

COMMANDERS' INSTRUCTION IN AIR WORK.—Attention is drawn in an Admiralty Fleet Order, to the provision of arrangements for a few naval officers of the rank of Commander to be lent to the Royal Air Force for a short period of service with Air Force units at home in order to obtain practical experience of the work of the Air Arm in all its aspects. Commanders of seniority, June, 1922, or junior, who are desirous of undergoing the course should forward their names without delay.

RETIRED PAY AND PENSIONS OF PERSONNEL.—New regulations were approved by Order in Council in October relating to the award of retired pay to officers of the Royal Navy or Royal Marines retired on account of sickness or injury attributable to the conditions of the Service whilst attached to the Royal Air Force for service with the Fleet Air Arm; and for the award of pensions or allowances to the widows, children, or other dependent relatives of "attached" officers who die of wounds, injuries or disease directly attributable to the Service.

AIRCRAFT-CARRIERS.—During the latter months of 1925, the aircraft-carrier "Furious," Atlantic Fleet, was under repair whilst available at Portsmouth during winter leave. The "Eagle," Mediterranean Fleet, returned to Portsmouth on November 24th for refit. The "Hermes," also belonging to the Mediterranean, remained on detached service in China. H.M.S. "Vindictive," having embarked a flight of aircraft, left England to join the China Fleet. The "Argus" is paid off for lengthy repairs at Chatham.

BADGE FOR NAVAL OFFICERS ATTACHED TO THE FLEET AIR ARM.—Badges of approved pattern are now available for issue, and are to be worn by all officers attached to the Royal Air Force for service in the Fleet Air Arm from the date of their joining a R.A.F. Training School for *ab initio* flying training.

(See also "Air Notes," p. 196).

FOREIGN NAVIES.

CHILE.

RE-ORGANISATION PROPOSED.—For some time past, says the *Times* correspondent at Valparaiso, the Chilean Government has been considering the re-organisation of the Navy, and at a recent meeting of naval authorities on board the battleship "Latorre" a programme of construction was drafted and submitted to the Ministry of Marine. The dominant idea of the re-organisation is to begin with the construction of smaller craft, and it is likely that orders will be placed in Europe for six destroyers, followed later by orders for several light cruisers. Orders have already been placed in Italy for numerous seaplanes, and a special Chilean naval mission is now in Italy to supervise their construction. It is probable that the destroyers and the other vessels will be built in Great Britain, for President Alessandri, in his remarks when he took farewell of the Prince of Wales, said that he wished the Prince would do his utmost in support of a British naval mission to Chile consisting of men capable of giving instruction in the latest advances in naval science.

BRITISH NAVAL MISSION.—Two Commanders and two Lieut.-Commanders, Royal Navy, have been lent to the Chilean Government. (See under "Personnel," p. 170).

FINLAND.

NAVY GRANT WITHHELD.—The Finnish Government, formed on 30th March by Professor Aritti Tulenheimo, resigned office on 10th December on the question of its naval programme. The Government had introduced a Bill providing for the building of two gunboats, mentioning 315,000,000 m. (£1,650,000) as the lowest sum which should be spent on naval construction. The Riksdag reduced this to 215,000,000 m., with some understanding that the remaining million would be found in the 1926-27 Budget. At the third reading, the Riksdag decided to leave the matter in abeyance until after the next election, and when the Government pressed for the additional amount, the Riksdag voted only 47,000,000 m. in the 1926 Budget, with no guarantee for the future, whereupon the Ministry resigned.

LOSS OF A DESTROYER.—In the course of the naval controversy, political capital has been made out of the loss of the destroyer "S. 1" (formerly the Russian "Proslivi") on 4th October last. This small vessel was caught in a gale near the Island of Råfso, became water-logged and unmanageable, and was finally observed to capsize. She had a crew of three officers and fifty men on board at the time.

FRANCE.

NAVAL ESTIMATES.—The total estimates for 1926 amount to 1,496,507,400 francs, an increase of 244, 533,935 francs on last year's budget. New construction accounts for about 170,000,000 francs. Provision is also made for improvements to coastal batteries and the installation of anti-aircraft defences. The estimates also take into account a Naval Aviation Service programme, to be completed by 1st January, 1938. The first part of this programme deals with the development of naval air stations, the remainder to the creation of new squadrons.

A reduction of 2,000 on the 55,000 total effectives of naval personnel is foreshadowed. This will be chiefly effected in shore establishments.

PROGRAMME ACCELERATION.—M. Leygues, Minister of Marine, stated in a Press interview that he intended to speed up the execution of the naval programme, which his predecessor had intended to delay, because the minimum number of ships allowed under the Washington Treaty had not been reached. The present programme was almost a year in arrear, but the Minister hopes to bring it up to the proper level within six months.

LAUNCH OF THE "DUQUESNE."—The first of the 10,000-ton cruisers for the French Navy was launched at Brest in December, and named the "Duquesne." She was laid down in the summer of 1924, and is due to be completed during April, 1926, with her sistership, the "Tourville." These vessels will have Rateau turbines of 120,000 horse-power, designed to give a speed of 34-35 knots, but it is expected that 140,000 s.h.p. may be obtained, and a speed of 36 knots. The oil fuel capacity will be sufficient for 5,000 miles at 15 knots. Eight 8-inch guns form the principal armament, with eight 2.9-inch anti-aircraft and eight 3-pounder guns, and each cruiser will be able to carry two seaplanes.

GUNBOAT IN INDIAN WATERS.—The gunboat "Alerte," which visited Singapore from 13th to 18th November, sent out a wireless message in the Indian Ocean on 25th November that she was in urgent need of water. This was picked up by the P. & O. mail steamer "Razmak," which, although pressed for time, arranged a rendezvous at 1 a.m. in lat. 17.16 N., long. 65.0 E. The "Alerte" proceeded accordingly, and met the liner, making fast at 4.51 a.m. on the 26th, when

twenty tons of fresh water were transferred to her, and at 5.35 a.m. she cast off, the " Razmak " proceeding at full speed for Bombay.

DESTROYER TRIALS.—The destroyer, " Simoun," one of twelve laid down in 1923, of 1,434 tons, 30,000 horse-power, and a designed speed of 33 knots, has been tried with good results. On her eight-hour full-power trials, she made a mean speed of 33.17 knots. Later, she did 33.20 knots for eight hours, and 34.30 for one hour, in rough weather conditions.

GERMANY.

" EMDEN " COMMISSIONED.—The new cruiser, " Emden," has been commissioned for trials. She is the first vessel built for Germany since the war, and is limited in size by the restrictions of the Versailles Treaty to a displacement of 5,600 tons. Her armament is eight 6-inch guns and four (19.7 inch) torpedo tubes, and her designed speed is 27.5 knots.

GREECE

REPORTED SUBMARINE CONTRACT.—The announcement was made in November that an undertaking had been signed by the Greek Ministry with a French syndicate, including the Chantiers Navals Francais and the Chantiers de la Loire, for the building of three submarines of 710 tons each. The cost was given as £115,000 for each vessel, and the work is to be completed in two years.

THE CONTRACT FOR THE " SALAMIS."—The Dutch Admiral Sourie, as neutral arbitrator, has decided, according to the *Messageur d' Athènes*, that Greece is bound by the contract signed in 1912 for the building of a battle cruiser, the " Salamis," at the Vulcan shipyard, Stettin. This vessel was launched on 11th November, 1914, and used for a time as a floating barracks at Kiel. Her armament, ordered in America, was obtained by Great Britain, and used for monitors. The vessel could not be completed for Germany after the armistice, under the Versailles Treaty. The reported decision caused considerable surprise in Greece. If confirmed, it means that, in addition to the sum of £435,000 already paid, Greece incurs a liability of a further £500,000 on the completion of the vessel. In view of her present economic position, this would be a serious matter, particularly as she would be burdened with a large ship of obsolete type for the upkeep of which she has neither money nor men. The *Times* correspondent at Athens understands that an appeal to the Hague Court will be made.

A NAVAL REVIVAL.—In the course of a speech at Athens on 14th December, General Pangalos, who was accompanied by members of his Cabinet, said that Greece was surrounded by many dangers, which necessitated the re-organisation of her Army and Navy. Within the space of five months the Fleet would be re-organised. The cruisers would have finished their refits within two months, and new ships had been ordered, so that within a short time Greece would be the mistress of the eastern basin of the Mediterranean.

JAPAN.

SHIPBUILDING CONTROVERSY.—A controversy has been in progress between the Japanese Ministries of the Navy and Finance regarding the requisitions of the former. The Navy Department asked for a certain programme of building, aggregating 100,000 tons, in the next five years, which the Finance Ministry considered

could not be executed owing to the need for economy. Without altering the programme, the period allowed for construction has been extended, and a start is to be made in 1926 with a few destroyers only. The reduction of the estimates, it is understood, will delay the building of four 10,000-ton cruisers and ten large submarines.

1926 ESTIMATES.—It was announced from Tokio on 15th November that the Cabinet had adopted the Budget for 1926, in which out of 1,598,000,000 yen, 15,000,000 yen is appropriated for the Navy for new construction purposes. Admiral Takarabe, the Navy Minister, was represented as having been victorious over the retrenchment advocates under Mr. Hamaguchi, Finance Minister. Some 35,000,000 yen are to be spent upon destroyers within three years, but the Admiral has not withdrawn his requisition for 200,000,000 yen for replacements over a period of five years. Questioned on the matter in the House of Commons, Mr. Bridgeman, the First Lord, said the only authoritative information received at the Admiralty as to the Japanese Navy Estimates showed an increase from 227,000,000 yen (nominally £23,282,000), voted in 1925-26, to 239,000,000 yen (nominally £24,512,500) proposed for 1926-27.

SOVIET UNION.

NOTES ON NAVAL PERSONNEL.—Bolshevik dogmas do not admit the idea of rank, but only differences in duties; therefore all ranks are open to "lower deck" ratings, even appointments to commands. At present some officers of the old Imperial Navy are still serving, pending a sufficient supply of trained men.

When the schools were restarted, it appeared that a course of six months was considered as sufficient for men who aspired to the duties of officers, but at present courses of six years or more are being provided, according to the training required.

Recruiting is carried out in two ways: voluntary and by levies of conscripts. About twenty-five per cent. of the latter re-engage for a further period of voluntary service.

The first quality necessary for the volunteer is the firm profession of communist faith; then he must be able to read and write. Enrolment takes place in the autumn; in the winter and the spring preliminary courses are taken by recruits ashore and afloat; in the summer this personnel commences to serve in the Fleet.

In the following autumn the men wishing to go through the courses to become officers are submitted to examinations. In this way, about 300 youths can be admitted yearly to a "Preparatory School" course, which, including the summer recesses, lasts, about three years and is open for all branches.

After the "Preparatory School," those who are suitable continue their studies at the "Naval School" and at the "Naval Engineering Schools" for a period of three years, after which they go through the higher courses, and, finally, a "Naval Academy" which is divided into the following sections:—

Naval Staff.	Naval Construction.
Ordnance.	Electrical.
Engineering.	Hydrographic.

The time in the various schools and courses is not yet definitely fixed, because the new Soviet Admiralty has not yet been able to pass young men, enrolled since the revolution, through the entire course of the schools; but some officers of the old Imperial Navy, re-admitted at present, have been allowed to go through certain higher courses of the Academy.

As has been said already, the Soviet Navy does not admit rank, but merely capacity for command. Men who are considered to have this capacity wear a uniform similar to undress uniform, with red stripes on the left cuff, surmounted by a star with five points of the same colour. The power of command is only exercised on board or on duty. Away from the ship, or outside naval areas, the men are not obliged to obey those who exercise the function of officers, and do not salute them. But it seems that this state of affairs will not last long. Officers will maintain their position even outside the service; and the red stripes may be surrounded by a gold line.

In small ships the officers mess at the same table as the crew; in larger units the food is always the same for all, but the Commanding Officer and certain other officers mess separately.

A feature of all ships is the "Lenin Corner," or a recreation space in which officers and men foregather. Portraits of Lenin and Trotsky adorn these "corners."

SPAIN.

A NAVAL STAFF COLLEGE.—A "School of Naval Warfare," analogous to our Staff College, has been inaugurated at Madrid. The first batch of Lieut.-Commanders and Lieutenants started instruction there on 11th October last.

The course lasts one year, the first nine months of which is spent in study, and the remaining three in practical instruction afloat. Lieutenants must have had two years' sea service, and one more in command of a vessel, or have performed active service with the Air Service while holding a pilot's certificate.

SENIOR OFFICERS' COURSES.—During the last months of the staff course there is a short course for officers of Captains' and senior Commanders' rank. This is preceded by a month's technical course.

A COMBINED OPERATION.—The Spanish Navy was responsible for organising the landing at Alhucemas Bay in connection with the Moroccan Campaign, and is much elated at the success of their share in the operation.

NEW CRUISER.—The "Almirante Cervera" was launched at Ferrol on 16th October last. She is of 7,850 tons, 33 knots speed, and will carry eight 6 in., four 4 in. A.A., and two 3-pounder guns.

UNITED STATES.

LAUNCH OF THE "LEXINGTON."—The aircraft-carrier "Lexington" was launched from the Fore River yards of the Bethlehem Shipbuilding Company at Quincy, Mass., on 3rd October. This vessel, originally designed as a battle cruiser, but abandoned as such under the Washington Treaty, will carry 72 aeroplanes, and has a speed of 33 knots. The naming ceremony was performed by Mrs. Theodore D. Robinson, wife of the Assistant Secretary of the Navy. *The Army and Navy Journal* (Washington) gives the following particulars of the "Lexington": Length over all, 888 feet; beam, 105 feet; displacement, 33,000 tons; s.h.p., 180,000; armament, eight 8-inch guns, mounted in four turrets, and anti-aircraft and machine guns. Sister ship of the "Saratoga," launched on 7th April, last, the "Lexington" was the heaviest ship ever launched in the United States, being about 2,000 tons nearer completion than her sister vessel. The radio equipment will be of the most modern type. A single antenna will lead to the deck from a topmast so tall that it will have to be lowered to pass under the Brooklyn Bridge. The two vessels will be completed about the end of 1926.

NO MANŒUVRES IN 1926.—At the end of November, the Navy Department announced that the heavy cost of the manœuvres off Hawaii, and the subsequent cruise of the Fleet to Australia and New Zealand, together with other considerations of economy, precluded the possibility of naval manœuvres on a large scale in 1926, and it was proposed that the operations off the West Coast of South America be abandoned. Extensive manœuvres are planned during 1927, with the Army co-operating, probably off the East Coast of the United States.

PERSONNEL PROBLEMS.—The Navy Department was stated in December to have asked Congress to increase the enlisted personnel of the Navy from 86,000 to 89,000, and to 96,000 next financial year. The Department represented that the Fleet is undermanned, and that in consequence its efficiency is impaired. The Department also asks for increased appropriations, to provide for 1,500 additional pilots for aviation. In order to maintain the Navy personnel at 82,000, the recruiting stations were last November accepting an average of 296 applicants a week, to replace wastage. Lack of funds to pay extra personnel prevented the maintenance of the authorised total of 86,000. Rear-Admiral W. R. Shoemaker, Chief of the Bureau of Navigation, reports that the number of desertions has fallen from 7,787 in 1924 to 4,657 in 1925, there being a reduction of 20.8 per cent. in desertions during the first year of service.

SECRETARY'S REPORT.—The Annual Report, presented as usual at the beginning of December, of the Secretary of the Navy, Mr. Curtis D. Wilbur, describes as notable events of the year the visit of the United States Fleet to the British Dominions, and the completion of the scrapping of the capital ships in accordance with the Washington Treaty. Dealing with construction, he mentioned that Fleet submarine "V. 1" would be ready for regular service in December, the "V. 2" was already in commission, the "V. 3" would be completed in February, 1926, and the minelaying Fleet submarine "V. 4" would be completed in the first half of 1927. Fleet submarines "V. 5" and "V. 6" and two light cruisers will be laid down early in 1926, and six river gunboats for Chinese service. No recommendation for a new building programme was made.

THE OLD "IMPLACABLE."

As the result of the appeal by Admiral of the Fleet Earl Beatty, a copy of which was published in the JOURNAL of November last, a sum of about £19,000 has been received to date towards the £25,000 required to repair and fit out the old wooden two-decker "Implacable" as a holiday training ship for boys.

Thanks to a munificent donation of £15,000 from "A Well-Wisher of the Navy," the immediate safety of the ship was assured before the close of 1925.

The Committee in charge of the Fund ask for continued support in order to complete the outstanding amount of about £6,000. They have been greatly encouraged in their task by a gracious subscription of £50 from His Majesty the King.

Cheques should be made payable to the Hon. Treasurer, Sir Vincent Baddeley, K.C.B., and sent to him at the Midland Bank, Westminster Branch, Wesleyan Hall, S.W.1.

An illustrated pamphlet describing the ship and what she will do for boys has now been prepared and will be forwarded to anyone interested on application to the Organising Secretary, "Implacable" Fund, c/o the Royal United Service Institution. Printed subscription cards will also be supplied to any responsible person who volunteers to collect for the Fund.

ARMY NOTES.

HOME.

REGULAR FORCES.

APPOINTMENTS AND PROMOTIONS.—The principal changes that have occurred during the past quarter are the following :—

The King has been pleased to approve of the appointment of Colonel His Royal Highness The Prince of Wales and Duke of Cornwall, K.G., K.T., G.C.S.I., G.C.M.G., G.C.I.E., G.C.V.O., G.B.E., M.C., as Colonel-in-Chief of the West African Regiment.

Major-General A. R. Cameron, C.B., C.M.G., has succeeded Major-General Sir Cecil F. Romer, K.B.E., C.B., C.M.G., as Director of Staff Duties ; the former has been succeeded as G.O.C., Northern Ireland District, by Major-General F. F. Ready, C.B., C.S.I., C.M.G., D.S.O.

The following selections have been made :—

Major-General Sir P. P. de B. Radcliffe to command the Fourth Division, in succession to Lieut.-General Sir R. B. Stephens, who will vacate his appointment on April 1st.

Major-General T. T. Pitman to command the 48th South Midland Division, T.A., in succession to Major-General Sir P. P. de B. Radcliffe.

ARMY OFFICERS AND THE AIR FORCE : CONDITIONS OF SECONDMENT.—Army officers already holding permanent commissions in the Regular Army on 30th September, 1925, who are seconded for duty with the Royal Air Force on or after 1st October, 1925, will receive pay at the Royal Air Force rates in force prior to that date. If, however, any such officer is appointed to a permanent commission in the Royal Air Force he will be eligible only for the new Royal Air Force rates of pay and half pay from the date he is appointed to a permanent commission.

ROYAL CORPS OF SIGNALS : MECHANICAL SCIENCE COURSE AT CAMBRIDGE UNIVERSITY.—A two-year course at Cambridge University for selected officers of the Royal Signals will commence each year in October. The course is intended for officers who have a fair knowledge of mathematics and wireless. Officers attending the course will take up the Mechanical Sciences Tripos and will include " Electric Signalling " as one of the voluntary subjects for the Tripos. As an alternative to the Mechanical Science Tripos, an officer selected for the course would be permitted to take up the Physics and Mathematics Tripos with special sanction from the War Office, if his qualifications are such that it would be to the benefit of the Service that he should take up this alternative. They will attend the Long Vacation term at the end of their first and second years at the University, and will not be detailed for duty for manœuvres or training during the period of this term. Officers selected for these courses will be required to sign an undertaking that they will continue to serve for at least three years after the end of the course.

BOYS FOR THE ARMY.—The result of the last competitive examination for boys between the ages of 14 and 15 for training as apprentice tradesmen in the Army shows no diminution of interest in these facilities for boys' careers. 381 competed, and, while the Southern Counties supplied the larger number, most

parts of the country were represented. Of this number 206 satisfied the examiners that their education had reached such a standard as would enable them to avail themselves advantageously of the instruction given at the Army technical training schools.

The successful candidates will spend three years in training in a variety of trades with a view to their afterwards serving as Army tradesmen.

ROYAL MONMOUTHSHIRE ROYAL ENGINEERS : NEW SUPPLEMENTARY RESERVE COMPANIES.—Two Army Troops Companies, Royal Engineers, are to be raised in Monmouthshire to take over the headquarters and maintain the traditions of the Royal Monmouthshire R.E. (Militia). The new units will together form the Royal Monmouthshire Royal Engineers, and will be designated the 100th and 101st (Monmouthshire) Army Troops Company, R.E.

ROYAL ARTILLERY : RANK OF DRIVER ABOLISHED.—No man joining the Royal Regiment of Artillery will in future be enlisted in the rank of driver. All men enlisting after that date will enlist in the rank of gunner (except in any case in which enlistment in a higher rank may be permitted), and will be liable, as may be required, to perform the duties now usually performed by drivers. This decision does not affect any soldier who may be serving on 31st December, 1925, during the term of the engagement on which he is at that date serving.

CORPS OF MILITARY ACCOUNTANTS : COMPENSATION TO RETIRED OFFICERS AND MEN.—The special terms on which regular officers of the Royal Army Pay Corps or the Corps of Military Accountants will be retired in the event of their being deemed to be surplus to requirements, in consequence of the reduction of the establishment of the Corps of Military Accountants, are the following :—

Officers who have completed 15 years' service counting towards retired pay on the date of retirement will be awarded retired pay at the rates appropriate to their rank and service, together with a compensation element according to the scale and conditions laid down in Army Order 179 of 1922. Captains and subalterns who have not completed 15 years' service counting towards retired pay will be awarded gratuity according to the scale provided by the same Army Order. Officers of higher rank who have not completed 15 years' service counting towards retired pay will be awarded gratuities on a special scale.

Any officer of the Corps of Military Accountants who is offered and accepts or refuses transfer to the Royal Army Pay Corps, or an officer of either corps who receives permanent employment under any public department, whether under the Army Council or otherwise, within such period as the Army Council may determine, will have no claim to these special terms.

Warrant officers, non-commissioned officers and men of the Corps of Military Accountants discharged on reduction of establishment prior to the termination of their engagements will receive the benefits laid down in Army Order 180 of 1922, so far as that Order is applicable. A soldier who has been permitted to continue in the Service beyond 21 years for a fixed period will, on discharge, be eligible for these benefits and will in addition draw the pension for which he is eligible. Those who are offered and accept or refuse transfer to another corps for employment on clerical duties or are offered and accept transfer to another corps in any capacity, or who on discharge from the Regular Army accept permanent employment under any Public Department will have no claim to these special terms.

SOLDIERS AND THE PENSIONS ACT.—Under the Widows', Orphans', and Old Age Contributory Pensions Act, 1925, the normal contribution payable in

respect of a serving soldier will be at the ordinary rate of 9d. a week, and the soldier, like a civilian, will be required to pay half this sum. This payment will be recovered from the soldier as a stoppage from pay at a monthly rate of $1/7\frac{1}{2}$.

THE KING'S MEDAL: LIST OF AWARDS.—The King's Medal with clasp, "1925," has been won by the following:—

(i) Home Forces: No. 6837141, Sergeant-Major W. Jagger, 2nd Battalion, The King's Royal Rifle Corps. (ii) Australian Forces: Warrant Officer B. Taylor, Australian Instructional Corps. (iii) South African Forces: Captain R. Bodley, 5th Mounted Rifles (Imperial Light Horse). (iv) Canadian Forces: Lieutenant D. T. Burke, The Governor-General's Foot Guards.

The Medal with clasp, "1925," for the champion shot of the Military Forces in India has been won by Risaldar Abdul Rauf Khan, 2nd Lancers (Gardner's Horse).

MINIATURE RIFLE SHOOTING.

THE FOLLOWING COMMUNICATION HAS BEEN RECEIVED FROM LIEUT.-GENERAL SIR ALFRED CODRINGTON, K.C.B.:—

Queen Alexandra's gift of a beautiful challenge cup to the Society of Miniature Rifle Clubs for competition among county teams made up of riflemen selected on the strength of their marksmanship from clubs and associations affiliated to the S.M.R.C. is not so widely known as perhaps it deserves to be. The late Queen-Mother took a practical interest in small-bore rifle shooting, and her sympathies with its intentions and aims resulted in Her Majesty's gracious gift, which, it is needless to add, is regarded by the followers of the sport as the blue riband of the popular recreation.

"Officers of high rank both in the Army and Navy," so the Secretary of the S.M.R.C. has stated in an interview, "have on many public occasions given decided opinions on the usefulness of miniature rifle shooting as the short cut to efficiency in Service rifle shooting. It trains a man to become an expert shot and to develop confidence in all the mysteries of rifle shooting. We have some 1,600 clubs and associations affiliated to us, representing a membership of about 100,000 persons, and whilst a fair percentage are recruited from the ranks of the Services—Army, Navy and Air Force—the greater number are civilians employed in mercantile offices and the workshops, mills and factories of the industrial centres of the country. And added to these workers we have a goodly number of the middle classes who find in small-bore rifle shooting a fascinating form of pastime which appeals because of its mental and skilful attractions."

"During the past few months some 146 new clubs have applied for affiliation. That testifies to the progress of miniature rifle shooting. The vast majority of these new clubs hail from working centres, and are manned by workers, who, at the ranges, can meet their employers and chiefs on common ground in friendly rivalry—not for a season, but all the year round and in all weathers, for the pastime can be followed indoors as well as outdoors on short ranges. The standard ranges run from 25 and 50 yards to 100 yards, and a range can be laid almost anywhere."

"The Council of the Society are appealing for 10,000 additional life members, whose only liability is one payment of a guinea per member. Their sympathy and support would be seen in consolidating the efforts of the Society in its work of developing what we regard as a national movement, the economic value of which cannot be over-estimated. Ours is the official authority that regulates and practically governs miniature rifle shooting, and our Council includes a number

of gentlemen whose names are household words throughout the country, and who give their time and services voluntarily, and assist in other ways."

Enquiries should be addressed to the Secretary of the S.M.R.C., 15, Arundel Street, London, W.C. 2.

TERRITORIAL ARMY.

PROMOTION TO LIEUTENANT.—Under the new regulations a second lieutenant, if commissioned before 26th October, 1925, may, after two years' commissioned service in his regiment or corps, be promoted to the rank of lieutenant, provided that he is recommended for such promotion. If commissioned or re-commissioned on or after 26th October, 1925, promotion to lieutenant may be granted after three years' commissioned service in his regiment or corps provided that such promotion is recommended.

NEW RATES OF PAY.—Officers of the Territorial Army, except those appointed before 26th October, 1925, will not be eligible for increments of pay dependent on length of service. Officers appointed before 26th October, 1925, will be eligible to qualify for increments of pay dependent on length of service, but only embodied commissioned service in the Territorial Army, or previous full pay commissioned service in the regular forces, Royal Navy, and Royal Air Force, will be allowed to count in such cases.

Men enlisted or re-enlisted into the Territorial Army on or after 26th October, 1925, will be ineligible for proficiency pay, educational proficiency pay, military proficiency pay, or for increments of pay dependent on length of service.

Men in receipt of the scales introduced as from 26th October, 1925, will be eligible to draw the rates prescribed for lance-appointments. Men in receipt of pay under the earlier (1919) scale, may, on appointment to lance rank, elect to receive the pay appropriate to that rank under the later (1925) scale, but men so electing will not be permitted subsequently to revert to the earlier (1919) scale, either on promotion or on ceasing to hold a lance appointment.

BAND UNIFORMS.—Walking-out dress, consisting of tunic or frock, trousers or trews, and forage or glengarry cap, may now be worn by Territorial Army Bands, when fulfilling musical engagements, provided no cost to Army funds is incurred. Highland bands, where the unit is authorised to wear the kilt, are allowed to have kilt, plaid, sporran and white gaiters. It has been further provided that the expense thereby involved is to be met from regimental funds or from surplus County Association funds. Walking-out dress may, however, not be worn when bands are parading with troops or except when fulfilling musical engagements.

THE DOMINION FORCES.

REGIMENTAL ALLIANCES.—The King has approved of the following regimental alliances :—

Australian Military Forces.—3rd Light Horse Regiment to the 3rd The King's Own Hussars; 11th Battalion, Australian Infantry, to The Royal Sussex Regiment; The Melbourne University Rifles to The Rifle Brigade (Prince Consort's Own).

Canadian Militia.—Permanent Force.—Corps of Royal Canadian Engineers to the Corps of Royal Engineers; Royal Canadian Corps of Signals to the Royal Corps of Signals; Royal Canadian Regiment to the Gloucestershire Regiment.

Non-Permanent Force.—The Fort Garry Horse to the 4th/7th Dragoon Guards; Canadian Corps of Signals to the Royal Corps of Signals; the Carleton Light Infantry to The Queen's Own Royal West Kent Regiment.

New Zealand Forces.—4th New Zealand Mounted Rifles (Waikato) to the 4th/7th Dragoon Guards; the Hauraki Regiment to The Royal Warwickshire Regiment; the Otago Regiment to The Cameronians (Scottish Rifles).

UNION OF SOUTH AFRICA.

CONSTITUTION OF A MILITARY BOARD.—His Excellency the Governor-General-in-Council has been pleased under the provisions of section 116 of the S.A. Defence Act, 1912, to make the following amendment to the Regulations for the S.A. Permanent Force :—

- (i) The following members, i.e.—
 The Minister (President of the Board),
 The Chief of the General Staff,
 The Adjutant-General,
 The Quartermaster-General,
 The Director of Air Services, and
 The Financial Under-Secretary,

shall constitute a Military Board which, subject to the control of the Minister, will enquire into, discuss, and record opinion on matters submitted to it affecting—

- (a) General policy of the defence of the Union of South Africa ;
- (b) Regulations framed under the Act in connection with the organisation and administration of the Union Defence Forces and Cadets ;
- (c) Expenditure on defence and its distribution.
- (ii) Members of the Board shall further exercise severally such powers and perform such duties as are assigned to them by regulations.
- (iii) Meetings of the Board will be convened by the President. In the absence of the President, the senior military member present shall preside.
- (iv) Three members shall constitute a quorum.
- (v) Minutes will be kept of the proceedings of meetings of the Board.
- (vi) The secretary will be nominated by the Minister.

FOREIGN.

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BELGIUM.

AVIATION COMMAND.—Alterations foreshadowed last year have now been officially sanctioned. Hitherto, the posts of Director of Military and of Civil Aviation have been combined under a section of the Ministry of National Defence. In future, Civil Aviation will be administered by a new Directorate General in the Ministry of Railways, Marine, Posts and Telegraphs. The Military Aviation will be administered by the "Direction de l'Aeronautique" at the Ministry of National Defence, and commanded and otherwise organised as at present.

BUDGET.—(a) The "Moniteur" sanctioning the adoption of the Ministry of National Defence portion of the 1925 Budget, shows the following sums as recoverable under the Peace Treaties:—107,298,552 francs, of which much the largest item is 102,600,000 francs for expenses of the troops of the Army of Occupation.

(b) The Budget of the Public Debt for the 1925 exercise is fixed as follows:—

(i) Ordinary expenses	..	..	..	2,137,368,064.20
(ii) Exceptional expenses	..	..	..	100,000

(c) After long delays, due to lack of a Government for some two months, the Chambers at last definitely passed the Military Budget on 26th August, 1925. The principal items are as follows:—

(i) Army:—				francs.
Total for ordinary expenses	..	..	520,862,108	
Total for exceptional expenses	..	..	72,212,926	
Grand total	..	..	593,075,034	

(ii) Gendarmerie:—				
Total for ordinary expenses	..	..	57,664,500	
Total for exceptional expenses	..	..	14,600,000	
Grand total	..	..	72,264,500	

ARMY OF OCCUPATION.—This Army command, under Lieut.-General Bourguet, is now combined with that of the Third Army Corps, Lieut.-General Evvard, until lately commanding the latter formation, taking over the First Army Corps at Ghent.

FRANCE.

CONSEIL SUPERIEUR DE GUERRE.—A presidential decree dated 21st September, 1925, defines exactly the composition and functions of the "Conseil Supérieur de la Guerre" and supersedes the original decree of 1920 on this subject.

1. The composition of the Superior Council of War is to be as follows:

- (a) Minister of War (President).
- (b) Marshals of France, as members with the right to vote.
- (c) 12 divisional generals (maximum), of which the Chief of Staff is one, as members with the right to vote.

The members of the Council are nominated by decree at the beginning of each year.

The divisional generals referred to under the heading (c) above are chosen from general officers who have been corps commanders for at least one year and who are designated for the command of a group of armies or an army on mobilisation.

Members of the Government called to sit on the Council have a deliberative capacity without having a right to vote.

There are also, in a deliberative capacity on the Council, without a right to vote, the Chief of Staff of the Navy and another member of the Superior Council of the Navy appointed by the Minister of Marine. When, however, the Superior War Council has to give an opinion which concerns the Navy, the two Admirals are admitted to the right to vote.

The "sous-chefs" of the general staff are members in an advisory capacity, fulfilling the functions of *rapporteur*, each one for the subjects under his jurisdiction.

A senior officer is employed as secretary of the Council.

2. The reasons which have led to this exposition of the status and functions of the members of the Council are given in a prefatory note signed by the Minister for War :—

- (a) It is pointed out that the rôle of the Superior War Council is to give a considered opinion on all questions dealing with the preparation for war. The Government is at liberty to follow or not to follow the advice given to it by the Council. It would therefore appear that a member of the Government called to sit on the Council in a deliberative capacity should not, as formerly, have a vote on the subject under discussion, since the Government itself will in the end give a ruling on the opinion expressed by the Superior Council of War.
- (b) The original Decree of 1920 gave a definition whereby members could participate in the sittings of the Council :—
 - (i) In an advisory, or
 - (ii) A deliberative capacity.

It would seem advisable to give all members the right of sitting in a deliberative capacity and to limit this right in certain cases, by not giving the power to vote.

- (c) It is suggested that the attendance in an advisory capacity be now limited to the " sous-chefs " of the general staff of the Army, or other officers with technical knowledge called in by the Council, to give information on a particular subject.

THE MILITARY BUDGET FOR 1925.—This has just been passed by both Houses and so becomes incorporated in the Loi de Finances. It may be considered under the following headings :—

- (a) Ordinary expenses.
- (b) Extraordinary expenses arising out of the Great War.
- (c) Non-permanent expenses—Reparations due to war damages.
- (d) " Compte Spécial " upkeep of troops in the Rhine and Ruhr.

The totals voted under these main heads for 1925, are as follows :—

(a) Ordinary expenses :—		Francs.
Section 1.—Metropolitan troops (Interior and Algeria and Tunis)	.. ..	2,352,004,583.
Section 2.—Colonial troops (Interior and Algeria and Tunis)	.. ..	264,068,910.
Section 3.—Construction and new material	.. ..	182,990,300.
¹ Section 4.—Morocco	.. ..	339,824,829.
Services of Alsace and Lorraine (Gendarmerie, etc.)	.. ..	910,400.
Total	.. ..	3,139,799,022.
(b) Extraordinary expenses :—		
Section 5.—Exceptional expenses due to hostilities	.. ..	104,578,222.
Section 6.—Sarre Basin	.. ..	21,000,000.
Section 7.—Levant	.. ..	173,341,225.
Services of Alsace Lorraine (Gendarmerie, etc.)	.. ..	850,000.
Total	.. ..	299,769,447.

¹Supplementary Credits due to operations in Northern Morocco have been voted separately (not included in this total), and amount to 183,009,000 francs.

(c) Non-permanent expenses—	Francs.
Reconstruction of buildings, destruction of shells in war zones, etc.	27,381,110
Total under these three headings ..	3,466,949,579
(d) "Compte Spécial"—	
Upkeep of troops in Rhine and Ruhr	591,037,000
Grand total of Credits voted for Ministry of War	4,057,986,579

Leaving out the "Compte Spécial" (Rhine and Ruhr), the credits voted for 1925, compare as follows with those of previous years:—

1925	3,466,949,579
1924	3,829,261,726
1923	3,579,794,632
1922	3,832,733,656
1921	4,568,458,709

It should be noted that the Estimates for 1924 were considerably less than the Credits finally passed, as it was found necessary to vote supplementary credits to meet the high cost of living, higher freights, and additional pay for *soldats de carrière*, and which was largely due to a considerable miscalculation arising from the fact that estimates were prepared for the double vote 1923-24 in the middle of 1922. The expenditure, therefore, for the year 1925 shows no marked feature but the gradual retrenchment during the post-war years in military expenditure continues.

A comparison with pre-war years serves no useful purposes under the vastly changed conditions and foreign commitments now undertaken by France, except where the fundamental sections, which apply to the Metropole and North Africa only are considered.

But if the totals for 1925 are brought to the pre-war purchasing value of money—reduced, in fact, in the proportion of 1 over 3.5—it will be seen that:—

Upkeep of personnel in 1925, expenditure is 75 per cent. of 1914.

Upkeep of material in 1925, expenditure is 153 per cent. of 1914.

Upkeep of animals in 1925, expenditure is 56 per cent. of 1914.

Training of army in 1925, expenditure is 99 per cent. of 1914.

Purchase of new material in 1925, expenditure is 12 per cent. of 1914.

The upkeep of material is, in fact, the only head under which the expenditure for 1925 exceeds that for 1914, i.e., by 53 per cent. This is largely caused by the fact that aeronautical material, involving a large capital outlay, was practically non-existent in 1914.

In addition to the above figures given for material, the *Loi des Finances* authorises expenditure for 1925 for "aeronautical fabrications" up to 80,000,000 francs, and by anticipation, expenditure for 1926 up to 50,000,000 francs.

Dealing with personnel, which, as shown above, is for 1925, 75 per cent. of that for 1914, a comparison of the pre-war figures with those for 1925 give the strength of the French army as follows:—

	Officers. ¹	Other ranks. ¹
1914	32,864	934,871
1925	33,417	651,985

¹ Before subtracting co-efficient for absence, equal to approximately 7 per cent.

There is therefore a reduction of 282,886 other ranks between 1925 and 1914. But both in the case of officers and other ranks, a large part of the army to-day is in the Levant, on the Rhine and in the Sarre, and as the daily upkeep of a man in the Levant amounts to 8 francs 42, and of one in the army of the Rhine or in the Sarre to 6 francs 20, compared with 4 francs 50 in the interior of France, it is obvious that the expenditure under this heading is very much higher than under pre-war conditions, when there are practically no troops outside the metropole, except the garrisons in North Africa and the overseas colonies.

The army of to-day, therefore, is in strength practically equal to that of 1913, before the operation of Three Years' Service Bill.

These figures, though including North Africa, do not include men on the Colonial Budget stationed in the Colonial possessions overseas.

The "Loi des Finances," just passed, fixes the Budgetary strength which is not to be exceeded, for 1925, as follows:—

Officers (active army)	..	..	..	..	..	32,000
Other ranks	..	..	..	..	..	607,000
Under officers	..	..	..	..	..	72,500
Horses	..	..	..	..	..	159,300

COMPTE SPECIAL.—Upkeep of troops in occupation of the Rhine and the Ruhr:—

	Francs.
The original projet had estimated under this head	650,178,220
The Chamber voted a reduction of	52,000,000
largely by saving in effectives (liquidation of the Ruhr) and saving of material, leaving ..	598,178,220
The Senate voted a further saving of some 7,000,000 francs, so that the final credits voted were ..	591,037,000
The corresponding figures for 1924 were	670,996,140

The organic Army of the Rhine is made up of 3 corps each of 2 infantry divisions, plus 1 cavalry division and some unallotted units.

During the occupation of the Ruhr, the 3 corps were made up to 3 divisions each by the arrival from the metropole of 3 reinforcing divisions. These have now been withdrawn, so that the Army of the Rhine is at the moment composed of 6 infantry divisions and 1 cavalry division and unallotted units.

The total effectives have been as high as 100,000, including officers. The actual strength given on 1st July was:—

Officers and other ranks, Rhineland	..	..	..	86,406
Officers and other ranks, Ruhr	..	..	..	9,824
				<hr/>
				96,230

The liquidation of the Ruhr, and the consequent repatriation of reinforcing troops, has been completed, and this brings the Army of the Rhine down to its normal strength and will effect a saving of some 25,000,000 francs.

Under the Colonial Budget the sum voted for military expenditure amounts to 207,553,596 francs.

HOLLAND.

ARMY MANŒUVRES, 1925.—In 1924 the Dutch War Department set itself to try and arouse public interest in military matters, which had greatly diminished since the Armistice. Importance was given to the occasion by the presence of the

Queen, the Minister for War, Foreign Missions and a number of receptions and banquets. In 1925 things were done on a more modest scale, although the formations engaged were more important. A divisional group, one infantry division and the light brigade took part in the manœuvres which were carried out in the neighbourhood of Amersfoort.

The choice of ground rested chiefly on reasons for economy. The country round Amersfoort is most uncultivated and resembles, to some extent, the country round Aldershot. In this area are included the infantry range at Zeist, the artillery range at Oldebroek, and the garrison towns of Amersfoort, Ede, Harderwijk and Utrecht. This choice fulfilled the requirements of economy by removing the necessity and expense of troop movements and camps, but failed to provide a manœuvre area corresponding to the conditions likely to attend modern warfare.

The question of material has not made much progress in the Dutch army, nor will the unfavourable financial situation permit of this deficiency being made up at an early date.

(a) Machine guns.—The armament of the infantry is complete in light and heavy machine guns.

The cyclist regiment has not yet got any light machine guns, and only possesses heavy machine guns on motor-bicycles.

(b) Rifle grenades.—Non-existent.

(c) Close support infantry artillery.—Since the slow-firing 6 cm. gun was abandoned, no smaller weapon has taken its place.

(d) Bomb throwers.—Non-existent.

(e) Artillery.—The number of the 7.5 cm. guns per division is still as it was before the war; each infantry division is, under the new organisation, provided with "afdeelingen" (2 or 3 batteries) of 12 or 15 cm. howitzers.

All these howitzers are provided with the old barrels; the question of increasing their range, however, is being studied.

The few 10.5 cm. howitzers which have been tested since last year have not yet been properly organised in the units.

(f) Anti-aircraft.—There are in existence eight anti-aircraft guns of 7 and 8 cm., of which some are mounted on lorries (old German pieces interned in 1918).

The military authorities attach great importance to anti-aircraft defence, especially with a view to the defence of Rotterdam and Amsterdam, but they do not appear to realise how great the task will be as compared with the means available. Importance appears to be attached to machine gun defence, although the inefficacy of such a system is realised.

(g) Mechanicalised artillery.—No organised unit. Several pieces were mounted on lorries. One type of lorry with semi-elliptical axle was tried at manœuvres. Bringing this gun into action appeared easy.

(h) Tractor-drawn artillery.—Experiments have been made for the last two years with various types of tractors; the suppression of a large number of horses is anticipated as likely to be advantageous and within the realms of possibility. Already 15 cm. howitzers are drawn by Fordson twin tractors; the wheels of these are of metal with wide rims fitted with rubber knobs.

A new Latil tractor (25 h.p.) was tried. It had wheels to which ordinary pneumatic tyres could be fitted for the road, or rims with spikes; on the road, these spikes are withdrawn into the inside of the rim. This arrangement appears to simplify traction in ploughed fields.

A 15-h.p. Citroën tractor with caterpillar wheels is on order and it is proposed to use this for the traction of field guns.

(i) Armoured cars.—Non-existent. One ordered in France.

(j) Miscellaneous.—When the river Eem was crossed, artificial fog generators were used to mask operations. This experiment was anything but convincing; the fog rose rapidly and exposed the ground.

(k) Aviation.—The material is very uniform and of recent type; it all comes from the Fokker works. The establishments at Soesterberg (East of Utrecht) are well equipped. The manoeuvres, in which 20 aeroplanes took part, showed again that the pilots are first class.

Two new types of Fokker's ordered by the army, the C.IV and C.V, destined respectively for observation and reconnaissance, were used for the first time. The latter type is fitted with a Hispano-Suiza engine of 450 (600) h.p.

The Dutch army continues to adhere to the two types of machines described above, i.e., artillery (observation) and chasers (or large reconnaissance). For bombing purposes the army will rely solely on requisitioned civil and transport machines.

SOVIET RUSSIA.

NEW REGULATIONS REGARDING COMPULSORY MILITARY SERVICE IN SOVIET RUSSIA.—The regulations relating to compulsory military service until recently in force, were issued in 1920, and were really a recast of the old Tsarist regulations, with certain amendments and supplements to make them accord with the daily life and requirements of the Red Army, the organisation of which is "based on entirely different principles from those of the Tsarist Army." The territorial system, on which almost one-half of the Red army is based, demands fundamental changes in the administrative methods adopted in the army and the regulations for compulsory military service.

The regulations contain novel points, the most interesting of which are as follows:—

From the first part, including the preliminary instructions, it is emphasised that service in the army is a privilege of the working masses. "The non-working elements, who cannot be trusted with the armed defence of our country, since they might rise against the working masses, are therefore deprived of the right of defending the U.S.S.R."

In order, however, to make the non-working classes share the burdens connected with military service, a certain contribution is to be paid to the Government by the "politically unreliable" classes.

A very characteristic definition of the Red Army is given, i.e., "an organisation of armed forces composed of the working masses in their struggle against capitalism."

It is worthy to note that this Red "Army" includes the military, naval and air forces, also of troops with special designation, the O.G.P.U. troops and the so-called "escort" troops.

Compulsory military service is divided into the following stages:—

- (a) Pre-enrolment training.
- (b) Service with regular or territorial units, or a period of special training outside the Army.
- (c) Service in reserve units.

A *levée en masse* has been proposed only for citizens politically unreliable."

The period of military service is 21 years (from 19 to 40 years of age), and is divided as follows:—

- (1) From 19 to 21 years of age—compulsory pre-enrolment training.
- (2) From 19 to 26 years of age—service with regular or territorial units, or special training outside the army.

- (3) From 26 to 34 years of age—service in the reserve of the first category.
- (4) From 34 to 40 years of age—service in the reserve of the second category.

Pre-enrolment training.—All citizens between 19 to 21 years of age, prior to their being called up for military service, must undergo pre-enrolment training.

A two-years' training period, including 210 hours of exercises, has been established in special training camps organised throughout the country. The aim of this training is "to give military and political instruction to young men and maintain their physical fitness." All expenses connected with the training are paid by the local administrative authorities.¹

Enrolment.—All citizens who have reached their 21st birthday before the 1st January of the enrolment year, are called up. They undergo a period of active service between September and November. The "recruiting commissions" are charged with the distribution of recruits among regular and territorial units. In certain cases, the recruits are trained in a special manner outside the army.

The Commissions are responsible for the physical fitness of the recruits and their attitude towards the Soviet Government. The most loyal elements are appointed to the territorial units. Those who are entitled to privileges—in view of their domestic circumstances—are allowed to undergo "special training outside the army."

Active service with the regular units.—The 5-years' term of service with the regular units is composed of active service and periods of long leave :—

- (1) In the Navy—4 years of service (1 year's leave).
- (2) In the Air Force—3 years of service (2 years' leave).
- (3) In other arms of the Service—2 years of service (3 years' leave).

During the periods of leave, the men remain on the registers of their units, and may be called up to take part in manoeuvres (for a period not exceeding 1 month, non-commissioned officers for 2 months).

Soldiers on leave are considered "off duty."

Service with territorial units.—Those serving with territorial units remain, in most cases, at their permanent places of residence, and are called up for training periods.

The 5 years' service is divided as follows :—

1st year of service—a 3 months' training period for all arms of the Service. During the 2nd, 3rd, 4th and 5th years of service, training periods not less than :—

In infantry	..	..	..	..	4 months in all.
In cavalry	..	..	..	..	6 months in all.
In technical troops	..	..	..	..	5 months in all.

Independently of the above-mentioned training periods, men belonging to territorial units may be called up for training outside the army. Not less than 1 week of this training is to be given in the course of a year.

Thus the total training period in territorial units is :—

Infantry and artillery :—

- 7 months' training with the units.
- 4 weeks' training away from units.

¹ It is rumoured that this military training is entirely neglected in many districts where no military personnel is available to carry it out.

Cavalry :—

11 months' training with the units.

4 weeks' training away from units.

Technical troops :—

8 months' training with the units.

4 weeks' training away from units.¹

Training outside units :—

The following men only are appointed by the recruiting commissions to undergo military service by training away from units :—

(a) Men fit for military service, who were left over after the completion of establishments in the regular and territorial units.

(b) Citizens who are less fit for military service than others.

Service in the reserve.—On completion of active service, the men are transferred to the reserve, where they remain until they are 40 years of age. Service in the reserve is divided into two categories :—

1st category—up to 34 years of age.

2nd category—up to 40 years of age.

The difference between these two categories is that the men of the 1st category are under strict control of the military authorities.

Complete discharge from the army takes place on the 1st January after the recruit has completed his 40th year.

During their service in the reserve, men may be called up to take part in exercises—the total length of training periods being not under 3 months and the annual training periods not exceeding 1 month.

The training of reservists can be carried out in two ways—either within units or in the training camps apart from units.

Postponement and shorter periods of military service.—Postponement of military service, according to Soviet regulations, can be arranged only for youths still in schools or colleges. The general rule is, that postponement can be granted only in peace time to men under 30 years of age.

A certain reduction of the term of service may be made for men who have completed secondary and higher school courses.

With regard to this particular point, the regulations run as follows :—

" All those persons who have completed the courses at secondary schools or higher schools and, after 1 year's military service (2 years in the Navy), have passed the examinations required for the rank of commander of reserve units, are entitled to a reduction of the term of service. (It may be reduced to 1 year in the Army and 2 years in the Navy.) "

Those who have attained the rank of " commander of the reserve units " are entitled to 4 years' leave, during which they are considered as attached to the territorial units.

¹ It is rumoured that the training of all technical (except railway) troops is virtually non-existent.

Those recruits who are appointed to undergo special training apart from units may remain in their homes, and from time to time are called up to take part in exercises carried out in specially organised training camps.

In the course of 5 years' service, the recruits in question must undergo 6 months' training, so distributed that the annual training does not exceed 2 months.

Volunteers.—Volunteers are admitted to the Red Army between the ages of 16 and 34. Foreigners are allowed to join the Red Army as volunteers. All volunteers must sign a contract for a year, but are not included in the Regular Service List.

Militia of the back areas.—"Militia of the back areas" is composed entirely of citizens "unreliable from the political point of view," also the so-called "non-working elements." Only men between 21 and 40 years of age can be called up to the "militia of the back areas." (This militia must not be confused with the "militzie," which is a civil constabulary.)

In peace time, citizens called up to the "rear reserve" must pay a certain military contribution and, in war time, they are attached to various technical units.

Admission into the "militia of back areas" depends on the fitness of recruits for military service.

Exemption from military service does not, however, mean that the citizen in question is exempted from paying the military contribution.

Citizens who are forbidden by their religion to serve in the army—if they are fit for military service—are sent to public works for a period of 3 years, after which they are transferred to the reserve, also on special conditions.

In case of mobilization, these reservists may have to be trained, but not for fighting units. One of the clauses in the regulations deals with the military service of women. Various details with regard to women's service in the army will be published separately and confirmed by the Soviet of People's Commissaries.

Rights and duties of those on military service.—With regard to the above, the regulations give a few main ideas which might serve as a basis for detailed regulations in future.

All citizens when on military service enjoy many more privileges than other inhabitants of the U.S.S.R.

Persons on military service are, however, not allowed to occupy profitable posts in Government institutions, or to take part in enterprise, directly or indirectly.

For all offences of a general nature, men on military service are responsible in the same way as the ordinary citizens.

General comments.—The new regulations do not introduce any important changes with regard to the duties of men on military service. Terms of service with the regular units and in the reserve remain unaltered.

A new feature is the introduction of long leave during which the soldiers remain on the registers of their units. As a result of this innovation, a higher standard of efficiency is attained from the point of view of the readiness of units for mobilisation.

The question of pre-enrolment training and military training outside the units is discussed in detail. Up to the present moment, the local authorities were given full initiative in dealing with these questions, which frequently resulted in the alteration of the main principles on which the training question was to be based.

In the new regulations this particular point is dealt with in accordance with the experience gained.

The predominant feature of the new regulations is a strong class feeling, in consequence of which the rights of the citizens are unequal. Their chief aim is, however, quite clear, i.e., they advocate the realisation of the motto: "A Communist people under arms."

SWEDEN.

RE-ORGANISATION OF THE ARMY.—1. The following details have recently been received concerning the re-organisation of the Swedish Army :—

Unit.	Total under old organization.	Total under new organization.
Divisions	6	4
Infantry regiments	28	20
Infantry companies	364	122
Cavalry regiments	8	4
Cavalry squadrons	50	17
Artillery regiments	10	7 plus 2 "corps"

From the above table it will be seen that not only have two divisions been disbanded, but there is also a considerable decrease in the establishment of units which have been retained.

2. In addition to the four divisions, the following troops are to be retained :—

- (a) The Upper Norrland troops, roughly equivalent to a brigade group.
- (b) The Gottland troops, consisting of 4 companies of infantry and 2 batteries of artillery.
- (c) An infantry brigade of 2 unattached regiments.

3. The infantry, therefore, consist of the following units :—

4 divisions of 4 regiments each	16 regiments.
2 regiments with the Upper Norrland troops	2 „
The unattached brigade	2 „
Total	20 „

4. The Gottland Infantry, which is styled an infantry "corps," is not included in the number of regiments, as it only consists of 4 companies, as stated in paragraph 2 (b).

5. As regards artillery, the 2 "corps" mentioned in the table (paragraph 1 above) are the Norbottens Corps at Boden and the Gottland Corps at Visby. Both these formations consist of two training batteries, but the cadres required for double that number are to be trained.

AIR NOTES

ROYAL AIR FORCE.

APPOINTMENTS.

His Majesty the King has approved the undermentioned appointments:—

To be Honorary Surgeon to His Majesty, Air Vice-Marshal D. Munro, C.B., C.I.E., M.B., M.A., F.R.C.S. (E).

To be Honorary Physician to His Majesty, Group Captain H. V. Wells, C.B.E.

R.A.F. MEDITERRANEAN COMMAND.—Air Commodore R. H. Clark Hall, C.M.G., D.S.O., assumed command of the R.A.F., Mediterranean, with effect 14th November, 1925.

ORGANIZATION, TRAINING AND DEVELOPMENT.

R.A.F. CADET COLLEGE.—As a result of the November, 1925, Royal Air Force Entrance Examination, it is anticipated that twenty-four candidates will join the Cadet College this month. This is a considerable improvement on the June, 1925, examination.

DOMINION NOMINATIONS.—A South African University graduate recommended by the Union Government has now been appointed to a permanent commission in the General Duties Branch. This is the first appointment under the University nomination scheme applicable to the Dominions.

On the recommendation of the Commonwealth Government an Australian candidate has been nominated for a cadetship at the Royal Air Force Cadet College, Cranwell. This is the first candidate recommended by the Commonwealth Government.

LEGAL BRANCH.—A further Royal Air Force vacancy in the Department of the Judge-Advocate-General has now been filled by the appointment of a qualified solicitor.

ACCOUNTANT OFFICERS.—As a result of a competitive examination conducted by the Civil Service Commissioners in September, 1925, 13 candidates with accountancy qualifications have been granted commissions as Accountant Officers in the Royal Air Force.

R.A.F. OFFICER FOR CHILEAN NAVY.—The Government of Chile have asked for the services of a Royal Air Force officer to be seconded to the Chilean Navy for two years for the purpose of giving advice and instruction in Naval Air work. Wing-Commander A. J. Miley, O.B.E., has been selected for the appointment.

THE LA CIERVA AUTOGIRO.—A demonstration of the La Cierva Autogiro was recently given at Farnborough to various officials of the Air Ministry and the Aeronautical Research Committee, by arrangement with the Spanish owner and inventor, Señor Don Juan de la Cierva.

Described briefly, the present autogiro consists of an Avro fuselage, under-carriage, tail unit and engine (complete with airscrew), but minus main planes.

in place of the main planes lift is obtained by a set of four arms or vanes, somewhat similar to a four-bladed airscrew of large diameter, but built up of wood and fabric.

These vanes are mounted at the top of an almost vertical support extending above the fuselage in front of the pilot's cockpit, and are free to rotate in a more or less horizontal plane, the axis of the vertical support being inclined slightly backwards from the direction of flight.

The aircraft is drawn along the ground by the action of the normal airscrew, thus causing the lifting arms to rotate; when revolving at a sufficient speed, they develop enough upward pull, owing to their shape, to lift the machine from the ground. Control is similar to that of the normal aeroplane, by virtue of the tail unit and a pair of ailerons mounted at the extremities of a steel tube so fitted as to bring them into the usual position on conventional aircraft. To equalise the lift developed by vanes moving in opposite directions relative to the direction of flight (i.e., when one vane tip is moving towards the *nose* of the craft and its opposite member moving towards the *tail*) the vanes are hinged at their point of attachment to the centre support. When stationary the vanes would fall down and hang vertically from these hinges, but for the presence of supporting wires and rubber shock-absorber cords, which allow them a limited downward motion; the tendency of the arms to fold *upward* when supporting the craft is neutralised by the centrifugal force caused by their rotation.

The resultant up-and-down or flapping motion while in rotation, has the effect of automatically altering the angle of incidence of the vanes and accordingly balancing the lift exerted on each side of the craft, thus preventing it from falling over sideways—a habit noticeable in other attempts to produce a helicopter.

NAVAL CO-OPERATION.

FLEET AIR ARM AND COASTAL RECONNAISSANCE UNITS.

IN HOME WATERS.—Since her commissioning on the 1st September, the flights in H.M.S. "Furious" have been engaged on a full programme of trials, deck-landing training and exercises with the Atlantic Fleet.

The students of the R.A.F. Staff College, Andover, visited this ship on the 12th October.

During the quarter the flying boats of 480 Flight at Calshot have carried out several patrol exercises in the Channel.

The landing ground at Novar has been temporarily re-opened for additional co-operation work with the Atlantic Fleet during their stay in Northern Waters.

IN MEDITERRANEAN WATERS.—The flights in H.M.S. "Eagle" have been employed continuously in training and exercising with the Fleet until the ship returned to Home waters at the end of November.

No. 481 Flight at Malta (equipped with Fairey III.D seaplanes) have co-operated with the Military and Naval units stationed at Malta, and have continued their normal routine of training and exercises.

ARMY CO-OPERATION.

TRAINING OF ARMY OFFICERS.—The individual training period for Army Co-operation Squadrons started on 1st November. During this period arrangements are made by Army Commands to attach officers for a short course to the

Army Co-operation Squadron allotted to them for training. Courses consist of about a dozen officers, and last one week. Each Army officer does a certain amount of flying, and receives instruction in the work of the Air Force in general, and the methods employed by Army Co-operation Squadrons in particular. A number of these courses were held during November and December.

A one month's course for Army officers was held at the School of Army Co-operation at Old Sarum during November and December. It was attended by officers of the rank of Major or Captain.

AUXILIARY AIR FORCE.

NEW FORMATIONS.—The following Auxiliary Air Force Squadrons are now formed :—

No. 600 City of London Bombing Squadron	..	Northolt.
No. 601 County of London Bombing Squadron	..	Northolt.
No. 602 City of Glasgow Bombing Squadron	..	Renfrew.
No. 603 City of Edinburgh Bombing Squadron	..	Turnhouse.

OVERSEAS COMMANDS.

IRAQ.

GENERAL.—The internal situation in Iraq has remained satisfactory except in the Sulaimaniyah area, where Shaikh Mahmoud continues to resist Government authority.

SULAIMANIYAH.—During the period from September to December last, air action has been employed against rebel forces, supply dumps and concentration centres with marked success. Small columns of Levy and Iraq Army troops, with aircraft co-operating, have also carried out operations against the rebels in certain districts for the purpose of recovering loot, preventing the rebels from levying taxes and re-establishing Government authority and prestige. On one occasion during September a strong column left Sulaimaniyah and marched through the Sharbahzer district, due west of the town, with the object of compelling Mahmoud to withdraw his forces from the Qizilja and Kani Manga Passes, where they were holding up the Jaf tribes, during the annual migration into Iraq from Persia, with the object of levying taxes from them. This operation was successfully accomplished without incident, and Mahmoud's failure to collect any large amount from the Jaf reduced his following considerably. From that time rebel activities were practically confined to a succession of raids and robberies in various districts round Sulaimaniyah.

In December Shaikh Mahmoud withdrew into Persia to recuperate.

NORTHERN FRONTIER.—The situation in the districts bordering the northern frontier has remained quiet, although a certain tension was apparent during the time the Council of the League of Nations was considering the Turco-Iraq Frontier question.

On the 29th October, a party of Sindi refugees who had taken refuge over the frontier, re-entered Iraq on a raiding expedition. They encountered an Iraq Army patrol, which, with assistance from friendly tribes, succeeded in driving them back over the frontier with the loss of one prisoner.

DESERT MOTOR ROUTE.—Owing to the unsettled state of affairs in Syria, the Nairn Transport Company diverted their trans-desert motor service, and the route is now via Jerusalem and Amman to Baghdad. Armoured cars from Iraq patrol the new route in order to give further security to the service.

FLIGHT TO TEHERAN.—On the 7th October the Air Officer Commanding travelled by air to Teheran. The A.O.C. returned to Iraq on the 9th, landing at Kirmansah route.

PALESTINE AND TRANS-JORDAN.

The Druze rising in Syria has necessitated continued vigilance on the part of the British forces in Palestine and Trans-Jordan. Constant reconnaissance, both ground and air, have been necessary to ensure that the frontiers were not crossed, in either direction, by unauthorised bands of raiders or rebels.

INDIA.

A large amount of Army co-operation and aerial survey work has recently been carried out by the R.A.F. In September an experimental air mail flight took place between Lahore and Delhi. A flight of three machines also visited Bunder Abbas (Persia), in connection with the survey of aerodromes for the civil air route to India.

EGYPT.

On the 15th October, two D.H.9.A's of No. 47(B) Squadron left Helwan at 1.10 a.m., and arrived at Khartoum at 2.55 p.m. the same day, having re-fuelled at Wadi Halfa en route. The distance (1,155 miles) was covered in twelve hours flying.

On 27th October a flight of three machines left Cairo for Kano, Nigeria, where they arrived five days later. After spending about a fortnight in Nigeria, the flight returned to Cairo on 19th November. The distance between Cairo and Kano is approximately 3,000 miles, and both the outward and homeward journeys were carried out according to programme.

CAIRO-BAGHDAD SERVICE AIR MAIL.—Air route duties have been carried out as follows:—

<i>September</i>	.. Aircraft	.. 12 Vernons	.. 6 Vimys	.. 8 D.H.9.A's.
	Passengers	.. 32 R.A.F.	.. 5 Army	.. 6 Civilian.
	Mail	.. 1,368 lbs.		
<i>October</i>	.. Aircraft	.. 8 Vernons	.. 6 Vimys.	
	Passengers	.. 12 R.A.F.	.. 4 Army.	
	Mail	.. 1,073 lbs.		

ADEN.

Operations have been continued against the Zeidis, who are occupying part of the Audali country in the north-eastern portion of the Aden Protectorate. The operations have been strictly limited to the Protectorate area. During October it was decided to allow the Audali tribesmen to make an attempt to recover their

lost country with close assistance by aircraft, and the flight was accordingly moved to Shukrah. After an initial success, the Audalis again retired to their former positions, apparently fearing a Zeidi advance in force. This actually did not materialise, and eventually the situation became the same as at the beginning of October.

The work of the flight has been as successful as could be expected, taking into consideration the small size of the unit and the very large area and difficult country over which the operations have been conducted.

BRITISH CIVIL AVIATION.

LIGHT AEROPLANE CLUBS.—The Light Aeroplane Clubs have all succeeded in enrolling a substantial membership, and the two Moths with which each club is equipped are being fully occupied in giving instruction. Two of the clubs have received gift aeroplanes to add to their fleet, and it is hoped that the example set may be followed in other clubs.

It has now been decided by the Air Ministry that a pilot qualifying for an "A" licence in any of the clubs will be considered to have qualified, as far as flying is concerned, to join the Auxiliary Air Force.

AIR TRANSPORT SERVICES.—After having been closed down for a considerable time, the Southampton-Channel Islands route has been re-opened, and operates once a week in each direction. The terminus in the Channel Islands is in Guernsey. The machine leaves Southampton at ten o'clock each Wednesday morning, and returns from Guernsey in the afternoon.

A Vickers "Vanguard" fitted with two "Condor" engines has now been taken over by Imperial Airways, Ltd., to be tried out by them experimentally for the Civil Aviation Department as a commercial vehicle. She is the biggest commercial aeroplane yet put into service, and is capable of carrying twenty-four passengers, but is actually fitted at the moment with seating accommodation for twenty-one. The general opinion of the pilots flying her is that she is a most satisfactory machine.

As a result of the survey of the Egypt-India (Karachi) route, carried out by the Director of Civil Aviation, accompanied by representatives of Imperial Airways, Ltd., it has now been decided that the route shall be opened on November 23rd, 1926. A provisional agreement has just been signed between the Air Ministry and the Company. The delay in starting is explained by the fact that no machines suitable for the route are at present available, and special machines must be built. In the first instance, the service will be run fortnightly in each direction.

AERIAL SURVEY.—A valuable contribution to the study of the problems of air survey has been made by Professor Melvill Jones and the late Major J. C. Griffiths by the publication of their book, "Aerial Surveying by Rapid Methods" (Cambridge University Press).¹ The distinctive feature of this book is the attention given to the problem of controlling the aeroplane during photography in order to minimise errors and distortion caused by changes of course and altitude of the camera. A second publication which materially adds to the literature of the subject has recently been issued by the Air Survey Committee—"The Manual of

¹(NOTE.—A review of this work appeared on page 608 of the *R.U.S.I. Journal* of August, 1925).

Graphical Plotting." This work has been compiled by Lieut.-Colonel L. N. F. I. King, O.B.E., R.E., and is being published by H.M. Stationery Office. As its title implies, this book discusses in detail the various graphical, as opposed to instrumental and mathematical, methods of plotting from air photographs.

The Air Survey Company, Ltd., have just concluded a contract with the Sarawak Government for the survey of an area of 1,760 square miles of the Rejang-Delta, and in addition a reconnaissance of the forest country lying between the Tintulu River and the Tenjar River. The work carried out by this company now totals 2,786 square miles of air photographic survey, comprising:—

Irawaddy Delta	..	..	..	..	1,350 sq. miles.
Miri Oilfields	..	..	..	..	1,350 "
Town of Rangoon	..	..	..	..	70 "
Yenanyaung Oilfield	..	..	..	..	16 "

In addition the company have carried out 15,178 square miles of forest type sketching, with some photography, in Tenasserim.

AVIATION IN FOREIGN COUNTRIES.

CZECHO-SLOVAKIA

ITALIAN CUP RACE.—This race is restricted to single-engined aeroplanes having a power of between 40 and 90 h.p., and capable of carrying a minimum useful load of 386 lbs.

Czecho-Slovakia entered two machines—one B.H.9 and one B.H.11, and Italy, Belgium and France nine between them. The B.H.11 obtained first place, with an average speed of 87 miles per hour. The B.H.9 failed to pass the minimum speed test.

FRANCE

ESTIMATES.—The following amounts were demanded in November for the 1926 estimates:—

Military Air Service	..	..	..	..	669,114,901 francs.
Naval Air Service	..	..	..	..	98,322,800 "
Colonial Air Service	..	..	..	..	10,459,299 "
Civil Aviation and the Office of the Under-Secretary of State for Air	..	..	..	..	152,575,000 "

Compared with the Estimates finally passed for 1925, these figures show the following differences:—

					Francs (to nearest million).
Military Air Service	..	..	..	..	73 increase.
Naval Air Service	..	..	..	..	9 decrease.
Colonial Air Service	..	..	..	..	3 increase.
Civil Aviation and the Office of the Under-Secretary of State for Air	..	..	..	..	No change.

Included in the demand for the Military Air Service is 80,000,000 francs, which may be regarded as a carry forward from the previous year's Estimates.

These demands are now being debated by the two Houses, after consideration by the Finance Committee, who proposed certain reductions.

MILITARY AIR SERVICE.—It appears that there have been unforeseen difficulties in the quantity production of the all-metal Breguet XIX, which is intended to be the standard machine for Army Co-operation and Day Bombing. Consequently the re-equipment of regiments is proceeding very slowly, and only a small number of squadrons have received the new machine, and these are all Army Co-operation units.

NAVAL AIR SERVICE.—A second squadron of Farman Goliaths, with 420 h.p. Jupiter engines, flew during the autumn from St. Raphael to Casablanca with only one stop for fuel at Alicante. These machines have interchangeable wheel and float undercarriages, and it is stated that the change can be carried out in the unit in a few hours. It is reported that three of these Goliaths have been destroyed, one in enemy territory near Sheshuan.

These two Goliath squadrons, as well as another that has moved from Bizerta to the Morocco area, have been co-operating with the other Services in the war against the Riffi.

COLONIAL AIR SERVICE.—An additional half squadron of the Colonial Air Service is to be formed in Indo-China during 1926. This will bring the strength there up to 2½ squadrons, while the West Africa squadron will remain the same.

Provision is also made in the Estimates for the replacement during 1926 of the Breguet XIV by the all-metal Breguet XIX, which should withstand the climate experienced by the Colonial Air Service units better than the present equipment.

PARIS-TEHERAN FLIGHT.—The flight referred to in the last issue of these "Notes" has been completed, all five aviators having recently arrived at Tehëran. No details are yet available about the comparative performances of the various types of aircraft.

ENGINE COMPETITION.—In March, 1924, a competition was inaugurated by the Under-Secretary of State for Aeronautics for aircraft engines of between 350-450 horse power. There were originally thirteen entries, but only eight arrived in time to qualify. Prizes amounting to 2,000,000 francs were offered, but the entrants had to engage to hand over complete specifications and details of manufacturing processes in the event of winning.

This competition has dragged on throughout 1924 and 1925, and it has recently been reported that four engines have completed their endurance tests, which amounted to 240 hours running on the test bench. No results have as yet been published, although it is not likely that any other entrants will complete the conditions.

GERMANY

AMALGAMATION OF AIR LINES.—During last summer a very large number of internal and external air services were operated in and from Germany. These were controlled by two groups:—(1) the Deutsche Aero Lloyd, and (2) various companies associated with the firm of Junkers, the majority of which were combined into a union called the "Europa Union." Up to date the subsidy which has been provided by the German Government has been divided equally between these two groups, payable for the operation of trunk routes on a fixed mileage basis. In addition to this Government subsidy, local municipalities and other bodies have paid subsidies for the establishment of further services to the towns in which these municipalities or bodies are interested.

With such a network of internal services as has been in operation in Germany during the past summer, it is obvious that the interests of these two concerns must on many occasions clash, and consequently efforts have been made to bring about an amalgamation. It is now reported that the negotiations for amalgamation have been concluded successfully, and that a new company, said to be named "Luftverkehrs, A. G." will be formed. The Junkers constructional company will remain independent, but will not in future take a direct part in the operation of subsidised air lines in Germany.

OFFICIAL SEAPLANE COMPETITION.—The Deutscher Luftfahrt Verband (German Aeronautical Society) has published, on the authorisation of the Deutscher Luftrat (German Air Council) the terms of a Seaplane Competition to be held in July, 1926.

The object of this competition is to find a seaworthy machine efficiently engined and of good performance suitable for postal services. At present a sum of 250,000 marks (approximately £12,500) is available for prizes, and any further money contributed will be devoted to special and consolation prizes.

The following are the conditions and details of the competition :—

Machines must be built in Germany.

Foreign machines will only be allowed by special permission.

Pilots must be of German nationality.

The start and finish for the distance flights will be at Warnemunde, where the airworthiness and technical performance tests will be conducted.

The competition will last four days, the course covering a distance of 3,000 to 4,000 kms. in all (2,000 to 2,500 miles approximately).

Compulsory landings will be made. These are not yet announced.

Nominations for the competition fall into three categories—advanced, ordinary and late. The advanced nomination is free, otherwise the fee is 300 marks (£15).

ITALY

LONG-DISTANCE FLIGHTS.—(a) *Rome-Melbourne-Tokyo-Rome.*—Full accounts of the conclusion of this flight (already reported on in the two previous numbers of this JOURNAL) have appeared in the daily Press, and it is not therefore necessary to refer to it again at length. Colonel Pinedo left Italy on the 23rd April, reached Melbourne on the 10th June, left Melbourne on the 16th July, reached Tokyo on the 26th September, left Tokyo on the 17th October, and finally arrived back in Italy on the 5th November. The most remarkable part of the flight was the last stage from Tokyo to Rome—a distance of approximately 10,900 miles accomplished in 20 days. The route followed was via Hong Kong, Singapore, Calcutta, Karachi, Baghdad, Alexandretta and Leros. Between Calcutta and Karachi the route taken was overland, the rivers being followed where possible, and landings being made at Benares, Delhi and Bahawalpur, in the Ganges, Jumna and Sutlej, respectively. It will in this connection be remembered that the machine used was a flying boat (Savoia 16 ter type with 450 h.p. Lorraine engine). The same machine was used throughout. The engine was changed at Tokyo. The total distance of approximately 34,000 miles was covered in 370 flying hours.

(b) *Eastern Europe.*—In the last issue of this JOURNAL reference was made to the flight of three B.R.1 machines (700 h.p. Fiat engines) through Central and Eastern Europe. The patrol which was led by Colonel Bolognesi, left Turin on

September 8th, and returned to Rome on October 18th, having covered approximately 3,000 miles over the following route:—Turin, Udine, Vienna, Budapest, Belgrade, Sofia, Constantinople, Bucharest, Tecuci, Jassy, Lemberg, Budapest, Udine, Rome.

Bad weather was frequently encountered, and the patrol was considerably handicapped through lack of weather forecasts.

The machines and engines were of standard service types without any modification.

(c) *Baltic States*.—The flight round the Baltic States of the two Macchi 24 flying boats (two 400 h.p. Lorraine Dietrich engines), led by Major Maddalena was carried out according to the schedule reported in the last issue of this JOURNAL, until the arrival in Switzerland on the return journey. By the direction of the Swiss authorities a route was selected across the Alps via the Spluga Pass instead of via the St. Gothard. On the south side of the pass a strong southerly wind was encountered, and the peaks were enveloped in dense clouds. Suddenly both machines were caught in a violent down draught of wind and were carried, with engines at full power, on to the rocks. The machines were completely wrecked, but the occupants escaped injury.

(d) *Trans-Atlantic Attempt*.—Count Casagrande left Genoa on 2nd November on his flight to South America, and arrived at Casablanca on 19th November, having alighted at Barcelona and Gibraltar. Since the latter date he has been detained at Casablanca on account of bad weather, although one unsuccessful attempt was made to reach Las Palmas. On December 25th his machine (Savoia 55 with two Isotta Fraschini "Asso" engines of 500 h.p. each) was badly damaged in a gale, and doubt is expressed as to whether the flight will be continued.

SPAIN.

FLIGHT TO SOUTH AMERICA.—Leaving Palos de Moguer on 22nd January, Comandante Franco, of the Spanish Army, in a Dornier Wal flying-boat, with two 450 h.p. Napier engines, reached Pernambuco on the evening of 31st January. He called en route at the Grand Canary, Cape Verde and Fernando Noronha Islands. With him were Captain Ruiz Alda, also of the Spanish Army, Lieutenant Duran, of the Spanish Navy, and a mechanic.

EUROPEAN—GENERAL

NORTH SEA SERVICE TO SWEDEN.—A Swedish company has in contemplation the operation of a service using Dornier "Wal" machines, fitted with two Rolls-Royce Eagle IX engines in tandem, from Gothenburg direct across the North Sea to Harwich, landing when necessary for refuelling purposes at Norderney, one of the Frisian Islands. A trial flight over this route was carried out with comparatively successful results some weeks ago.

WINTER TIME TABLES.—The majority of the companies operating in Europe have now put into effect their winter time-tables, which in all cases mean a curtailment of services, and in some the complete abolition of services. It is notable, however, that this year a very much larger proportion of services are continuing to run throughout the winter than has been the case in previous years.

UNITED STATES OF AMERICA

THE SINGLE AIR SERVICE CONTROVERSY.—Shortly after the disaster to the rigid airship "Shenandoah," and the supposed loss of the U.S. Naval Flying Boat P.N.9 No. 1, Colonel Mitchell caused a statement to be published in the Press. In this statement he said that in his opinion "the accidents were the direct result of incompetence, criminal negligence and almost treasonable administration of the National Defence by the Navy and War Departments."

As a result of this Colonel Mitchell was court-martialled for "conduct to the prejudice of good order and military discipline." In his defence, for which over seventy witnesses were called, he tried to justify his statements, but was, however, found guilty and sentenced to five years' suspension from the Army.

In the meanwhile, a great deal of public interest in the Air Services had been aroused, and, as reported in the November JOURNAL, President Coolidge, at the instigation of the Secretaries for War and the Navy, appointed a commission of nine gentlemen well known in national affairs or commercial circles, under the chairmanship of a Mr. Morrow, to study the best means of developing and applying aircraft in national defence.

After lengthy proceedings, the Commission rendered its report to the President on the 30th November, 1925. It recommended against the unification of the air services under one department for air, but recommended a few minor changes which will not materially alter the present position. The Commission stated in its report that the British Air Ministry could not be taken as a precedent because the geographical position of the United States was entirely different, and left out any question of "air menace."

In his opening message to Congress, the President referred to the Morrow Commission, and said that he saw no reason for any radical changes in the organization of the Air Services.

THE PULITZER TROPHY AIR RACE.—The annual air race for the Pulitzer Trophy took place on the 12th October, 1925, at Mitchell Field, New York. The race was won by Lieutenant Cyrus Bettis of the U.S. Army Air Service, on a special Curtiss Racer R.3.C.1, powered with a Curtiss V.1400 engine of 500 h.p., at an average speed of 248.99 m.p.h. over a course of 124.27 miles.

The previous highest average speed for the race, 243.68 m.p.h., was made in 1923 on a Curtiss Racer.

THE SCHNEIDER CUP RACE.—This race for seaplanes took place on 26th October, 1925, at Baltimore, U.S.A., and was won by Lieutenant James Doolittle, of the U.S. Army Air Service on the same Curtiss Racer, fitted with floats, which won the Pulitzer Race. The average speed over the triangular course was 232.57 m.p.h.

The previous record for the race was made in 1923 on a Curtiss seaplane racer by Lieutenant Rittenhouse, of the U.S. Naval Air Service, at an average speed of 177.38 m.p.h. There was no contest in 1924.

AIR MAIL SERVICE.—The Government recently called for tenders for the operation of an air mail service for eight routes. Seventeen companies put in tender for these services; five of the routes have been allotted up to date and it is anticipated that the remaining three will be given out at an early date.

AIRSHIP NOTES

GREAT BRITAIN.

EXPERIMENTAL FLIGHTS OF R.33.—Important experiments were carried out with R.33 during the month of October to investigate the effect of the pressure of the air on an airship, and the amount carried along with it in flight. Air pressures were recorded at points along the hull and over the fins while the ship was manœuvred, and the recording instruments were automatically photographed. The results are required to confirm certain theoretical assumptions and will be of great value in connection with the design of R.101.

AEROPLANE CARRYING EXPERIMENTS.—In the early part of December a D.H.53 aeroplane was successfully released and subsequently relanded on R.33, hauled up and refuelled. This marked the termination of a series of trials in which releasing had been successfully carried out, but the subsequent relanding had not been satisfactory. The arrangement permits of the pilot entering and leaving the aeroplane when it is hauled up in its travelling position.

EXPERIMENTAL WORK.—A section of R.101 is to be built for test purposes, and the fabrication of the girder work is now in hand. It will be tested to destruction, as a check on the theoretical calculations on the stressing of the ship.

AIRSHIP STATIONS.—*Cardington*.—The extension to this shed is proceeding under some difficulty on account of bad weather; the workmen experience trouble in carrying on at heights of 150 feet during high winds. The structure of the new mooring mast has now reached a height of 170 feet and is ready for the erection of the mooring arm and gear on the top platform.

India.—The general layout plan of the base to be established at Karachi has been completed.

ITALY.

The Aeronautical Correspondent of *The Times* states that Signor Umberto Nobile, the Director of the Italian Government Airship Construction Establishment, is bringing to England at the end of March the latest type of Italian semi-rigid airship, a vessel of some 670,000 cubic feet, which has been acquired by the Amundsen-Ellersworth expedition for Polar exploration.

The vessel will be flown under the command of Signor Nobile from Italy to Pulham, where it will be moored until such time as weather conditions are deemed favourable for the further flight north to Spitzbergen and the Arctic regions.

The formal request to be accorded landing facilities at Pulham came from the Norwegian Government, as the expedition is being carried out under that flag.

UNITED STATES.

REPORT OF "SHENANDOAH" COURT OF ENQUIRY.—The *Army and Navy Register* of Washington, published on 2nd January, the report of the Court of Enquiry set up to examine the facts and circumstances connected with the loss of the "Shenandoah." The following is a synopsis of the findings:—

- (1) The Court eulogised the design and construction of the airship and the skill and competence of the officers and crew.
- (2) "The operations of rigid airships over land as well as over sea is a proper and lawful function of the Navy."
- (3) The Commanding Officer was consulted and did not object to the proposed flight on the ground of adverse weather conditions.
- (4) The object of the flight was to test the mooring mast at Detroit, to train the personnel and to comply with many requests from inhabitants of that district. In this connection the Court recommends that such movements should in future be limited, so far as possible, to "essentially naval and military operations . . . especially in the case of new and experimental types."
- (5) There was no undue deterioration of structure.
- (6) "The wearing of the present type of parachutes would add to the general risks and hazards of handling such ships due to their interference, especially in emergencies, with the quick and efficient performance of duty. . . . Every effort should be made to develop a type . . . which could be worn in an emergency without being a handicap."
- * (7) "The Commanding Officer was entirely justified in starting the flight at the time chosen, as the weather maps and reports indicated nothing which would have rendered it unsafe or inadvisable."
- * (8) "A more extensive meteorological service which would require more weather stations and more frequent broadcasting of reports, probably, would greatly have contributed to the safe navigation of the 'Shenandoah' on this trip."
- * (9) "Although subsequent events showed that a change of course to South, when suggested by the aerological officer would have been advisable, the Commanding Officer's decision to maintain his course was a matter for his decision only, was made on his best judgment after discussion and consideration, and was based on the facts and conditions as then known or observed. Any error of judgment involved in this decision was entirely without negligence or blame."

* In an article on "Charting of the Upper Air," by Commander L. S. Garbett, R.N., Superintendent, Navy Services Division (Meteorological Office, Air Ministry) which appeared in the *R.U.S.I. Journal* of November, 1925, the author states: " . . . the weather charts constructed in the Weather Bureau, Washington, copies of which have now reached this country, show clearly the line of thunderstorms along the trough of the depression into which the ship ran, and further show the progress of the same depression from West to East across the States during two whole days prior to the disaster. There is therefore proof that the vital information as to weather conditions was actually in existence and if the voyage had to be made it seems to have been a case for a wide detour."—Ed.

(See also *Correspondence*, p. 162).

- (10) The measures taken by the commanding officer to bring the airship under control were in accordance with best established practice, while the conduct of all officers and men in the face of extreme danger was deserving of the highest praise.
- (11) The exact nature or extent of any damage caused through gas pressure following a sudden rise in altitude is not ascertainable but was probably not sufficient to have endangered the ship under normal operating conditions. The reduction of the number of gas valves originally fitted was, however, inadvisable.
- (12) "The final destruction of the ship was due primarily to large, unbalanced, external, aerodynamic forces arising from high velocity air currents. Whether the ship, if entirely intact and undamaged, would have broken under the forces existing or whether prior minor damage due to gas pressure was a determining factor in the final break-up . . . this Court is unable definitely to determine."
- *(13) Although the disaster indicates that a rigid airship can probably be destroyed through external aerodynamic forces only, and that such forces can arise from air currents unaccompanied by visible signs recognisable by aerologists in the present state of knowledge, the Court was of opinion that such a combination of circumstances was unusual and not such as to warrant doubt as to the safety and utility of the rigid airship to any materially greater degree than in the case of the other types of air or water-borne craft which might be subjected to unusual dangers.

**See footnote on opposite page.*

REVIEWS OF BOOKS.

Historical Illustrations to Field Service Regulations. Vol. II. By Major H. G. Eady, M.C., p.s.c. (Sifton, Praed & Co., Ltd.)

This is a book for which very many soldiers will be grateful. Our Field Service Regulations are admirable in their enunciation of precepts, but they do not illustrate those precepts by examples; and it is by examples that a precept is best fixed in the mind of the average individual. A work such as this, which gives, so to speak, chapter and verse for each statement in the Regulations, cannot but be of the greatest value.

There have been previous endeavours to supply this known want of illustration to the Regulations, notably in recent years General Bird's excellent work on "The Direction of War." But General Bird did not attempt to collate his historical examples with the text of the Regulations. The actual Regulations form the framework on which Major Eady has compiled his book. The various historical examples have been grouped under the chapter and section headings of the official text book, and it is this feature which will make the work under review so valuable to officers working for promotion.

Work for examination is not, however, the main object of the book. In his preface the author deliberately disclaims any intention of producing a "potted history for use at examinations," and expresses the hope that the examples given will lead officers to a more general study of the evolution of war. From this point of view it is perhaps to be regretted that lack of space has curtailed the quotations from the Regulations to a brevity which is sometimes almost cryptic. Such quotations as, "*Localities outside the area to be defended. . .*" (p. 192), when put by themselves at the head of a section are almost unintelligible without reference to the text of the Regulations; and though this necessity for constant reference is excellent training for the serious student, it tends perhaps to discourage the use of the book by the more casual reader. If we might venture a suggestion for the next edition—and to so useful a work of reference a second edition is almost assured—our suggestion would be the expansion of the quotations from the Regulations to readable length. The ideal would be to have the text of the Regulations on one page with the appropriate historical example printed opposite.

Inevitably the author's choice of such examples will provoke criticism; for certain of the best known episodes in history seem almost deliberately to have been avoided. The battle of Arbela is a good example of the triumph of discipline over numbers (p. 5), but Plassey is more familiar to every schoolboy.

There are some other cases in which an example from a British campaign might have been used instead of that selected from a Continental war. For instance, the charge of the 4th Prussian Hussars at Sadowa is quoted as an example of faulty ground reconnaissance (p. 110), but the similar instance of our 21st Lancers at Omdurman is certainly better known in this country. Lastly, we are surprised to find that practically the only instance quoted of a counter-attack during the Great War is the very minor episode of Givenchy, 1914 (p. 199), which, brilliant though it was, bears no comparison to the counter-attacks of the Ypres fighting which preceded it. The counter-attack of the 5th Brigade through Polygon Wood, the charge of the Oxfordshire and Bucks Light Infantry at Nonne Boschen should certainly be

quoted, to say nothing of the even more famous counter-attack of the Worcestershires at Ghehwelt, which latter provided a most remarkable example of the moral effect of a determined onslaught against a victorious but disorganised enemy.

An index to the book is badly needed. It would be of the greatest value to the student if such an index could show, under the names of battles and campaigns the various lessons to be deduced from them. The young officer taking up the study of a campaign might then be able to obtain beforehand a definite idea of the lessons he might expect to find illustrated therein.

The book has been edited with care and there are very few slips. But the 23rd Light Dragoons who charged at Talavera (p. 110) were not Lancers at that time. They were not converted into Lancers until after Waterloo, and lasted scarcely a year under that title before their disbandment.

Let us add that in spite of the compressed nature of the book the author has found space for relief by some pleasant quotations, notably as to Cromwell's naval forces at Dunbar, who stole "the spoyle of the field while the soldiers pursued," which, as the author remarks, is a new variant of combined operations!

Critical Study of the Campaign in Mesopotamia up to April, 1917.

(General Staff, A.H.Q., India.)

This is a collection of papers, historical and critical, which have their origin in a tour of the Mesopotamian battlefields, carried out by the instructors and students of the Staff College, Quetta, in the autumn of 1923. There are also included chapters on the battles of Shaikh Saad, Wadi and Hanna, by Major-General Sir W. D. Bird, and a chapter incorporating notes on the Lines of Communication by Lieut.-General Sir G. P. MacMunn.

The fact that the tour, on which these papers were based, was concluded before the first volume of the Official History made its appearance, greatly increases their interest, for no modifications have been introduced in order to "square" with the official version, and as a consequence, narrative and criticisms are unbiased.

There are few differences in the larger historical sense, and what discrepancies there are may be ascribed to the far greater volume of evidence available to the compilers of the Official History. On the other hand, there are brought to light for the first time innumerable details of the operations, and tactical incidents in the fighting, which are of the greatest interest, and palpably the fruits of that vivid personal experience, checked and counter-checked by argument and discussion, which are in many instances more valuable than the regulation "War Diary."

It is, however, as a commentary that this volume is chiefly valuable, rather than as history—because, for the latter, it must be owned, its style is altogether unsuitable, with the exception of a few chapters. The criticisms, however, are excellently framed, and will prove invaluable to students of this campaign; in nearly all cases criticism, though plainly expressed, is constructive; interesting suggestions are made, or alternative plans proposed.

In the earlier part of the book the chapters dealing with the advance on Ctesiphon, and Chapter VI, which describes the administrative difficulties inseparable from the Mesopotamian theatre, are particularly worthy of study. In this connection it is curious to notice that although there is evidence that the supreme importance of questions of organisation and administration is realised, yet only two chapters (exclusive of General MacMunn's Notes) are actually devoted to these subjects, as against twenty-two chapters devoted to the strategical and technical aspects of the campaign.

The question of co-operation with the Relief Force by the beleaguered garrison of Kut is carefully examined, and the conclusion reached that General Townsend should have made the attempt. The theory is impeccable—but it is open to question whether sufficient weight has been given to the moral effects of a siege and starvation.

The chapters dealing with General Maude's offensive at the end of 1916, and the capture of Baghdad, are full of suggestive speculation, particularly as regards the earlier operations. It is curious that even at this stage of the campaign the cavalry were still ineffective, and it seems possible that had he been better served in this respect, General Maude might have felt justified in moving more decisively in the initial stages of his advance.

After the capture of Baghdad the campaign is followed up to the battle of Estabulat, in April, 1917, the concluding operations being treated more historically than critically, and the book closes with a chapter of useful notes and observations on various questions as illustrated in the period dealt with.

A feature of the volume is the excellent collection of aeroplane photographs, which are of the greatest value. The maps are somewhat rough, but adequate. The index is by no means exhaustive.

Memoirs of Field Marshal Lord Grenfell, P.C., G.C.B., G.C.M.G. With a Preface by Major-General Sir Ronald Lane, K.C.B., K.C.V.O. (Hodder & Stoughton), London.

To those who knew the genial personality of Lord Grenfell, and the events with which his name is so closely linked, this book will doubtless provide interesting reading. To those, on the other hand, who knew neither the man nor his work, it will prove disappointing. The volume opens with a string of personal facts; the diarist's early career is then simply told without regard to literary or historical effect. This is unfortunate, for the story of the Kaffir and Zulu Wars of the seventies as seen by Grenfell should have afforded good reading. As it stands, the account of Isandlwana and Ulundi is incomplete and confusing. Lord Grenfell's own modesty has prevented his rendering a complete picture of his Sirdarship in Egypt; this is a great pity. Unfamiliar spelling, actual errors in names and titles, show the want of careful editing; thus on page 81, we are told that the safety of the Nubian desert was confided to Major Kitchener and General Rundle. Should it not read Captain Kitchener, and—certainly—Lieut.-General Rundle? Sir Leslie, at any rate, did not reach General's rank till many years later. This sort of slipshod nomenclature must spoil the book for the uninitiated. The visit to Moscow for the Tsar's coronation is much better and interesting. Lord Grenfell's interviews with the German Emperor are also well told. Here and there may be found other interesting sidelights. He disliked very strongly the Army Council system (page 148), and his refusal to join the Commission that was to report on the new Army system in 1903 was the decision of a truly honest man. But why could we not be told more about this momentous question? The omission leaves the feeling that Grenfell judged many things from a very personal standpoint, a feeling that is intensified by other passages in the volume.

Nevertheless, there are good things that can be found in the book, while the personality of the diarist comes out strongly. There are some sentences concerning Gordon, Campbell-Bannerman, Asquith and Kitchener which are nicely turned, and enlightening; but one leaves the book with a feeling of real regret that Lord Grenfell should not have entrusted the editing of his memoirs to a skilful hand.

We are the poorer for the omissions due to a true sense of modesty, while strings of names of guests met at occasional dinners will only weary the casual or civilian reader.

Elements of Field Artillery. By Captain Leslie Edwards Babcock, U.S. Army. (Princetown University Press.)

The author of this interesting volume has endeavoured, with a considerable measure of success, to present a complete and comprehensive text book dealing with the various subjects with which an artillery officer in the United States Army would have to be familiar.

The book itself is mainly technical, giving at considerable length the details of all the equipments at present used in the Field Army of the United States, and an insight into their line of research for the future. Instructions regarding care and maintenance and inspection of equipments are very clear and interesting.

A chapter devoted to the "British 75mm. Field Gun," showing photographs of a modified 18-pounder Mark II, may at a first glance, cause the reader to lose confidence in the book, but as explained elsewhere, a certain number of batteries of the U.S. Army are armed with British 18-pounders relined to take the ammunition which is common to other field guns of the American Army, which are mostly French 75s.

Four chapters are devoted to communications and the instruments needed to secure them.

Great importance is attached to radio communication, and it is interesting to note that the U.S. artillery are provided with a small portable W/T set capable of working up to five miles under favourable conditions on a wave-length band between 74 and 76 metres. It is stated that nine stations can be worked in a communication net on this band without mutual interference.

Other chapters deal with reconnaissance and occupation of positions, *liaison*, transportation by rail and water, equitation and animal management.

The opening chapter on organization gives the reader a very clear idea of the organization of the army generally, and the artillery in particular.

The book on the whole is well worth the time taken to read it, as it gives a clear insight into the American methods and material which are interesting to compare with our own.

The 1925 Edition of Jane's Fighting Ships. 8vo. Edited by Oscar Parkes, O.B.E., and Francis E. McMurtrie, A.I.N.A. (Sampson Low, Marston & Co.)

The new edition of this popular production shows an appreciable advance on last year's volume. There are unofficial sketch plans of the "Nelson" and "Adventure," additional pictures of many ships, including good photographs of the British "X. 1" and American "V. 1" submarines, the altered Japanese "Mutsu" and "Hosho," and ships of minor European navies. The Italian, Spanish, German and Soviet sections have been revised or re-illustrated; and better photographs of various British ships have been added.

In a Foreword, the publishers justly take credit for this revision and addition; but they should not be satisfied with anything short of absolute perfection. "Jane's" holds a place of its own, a place wherein there is no room for such indiscretions as the stern views of the "Revenge" and "Queen Elizabeth," and the broadside view of the "Furious." Modern photographic efficiency can easily provide

something better than these. Again, the large picture of the "Vindictive," which, presumably, is intended to show details, is as blurred and blotchy as a newspaper photograph.

The plans of American ports are for the most part large and clear, but those of the Japanese are not quite so good. We still hope to see this useful feature extended to include other Sea Powers, as was done in the pre-war "Jane's."

The aircraft views of battleships are still confined to the United States Fleet, the only additions being a good picture of the aircraft-carrier "Langley" and two rather blurred "detail" photographs of the "New York." The difficulty of obtaining aerial views of the warships of all nations is doubtless considerable, but it is hoped that every endeavour will be made to add to the present number in view of the ever-increasing importance of recognition from the air.

A new form of silhouette is suggested on a page at the end of the book. If the reception of this innovation warrants the change, the publishers propose to substitute such silhouettes for the existing block type. Readers are asked to express their opinions on the subject. In the new silhouette, Dr. Parkes has endeavoured to combine the general impression of a ship at horizon distance with enough detail for sister-ship recognition. Obviously, a small, clear photograph against a light background, such as some of the British destroyers and light cruiser illustrations, is the *beau idéal* of recognition pictures, but as a collection of such photographs for every warship afloat would probably be impossible, even for "Jane's Fighting Ships," we are inclined to think Dr. Parkes' silhouettes the best substitute. They are a decided improvement on the existing ones, and would be yet another valuable addition to this invaluable publication.

The Strategy and Tactics of Air Fighting. By Major Oliver Stewart, M.C., A.F.C. (Longmans, Green & Co.).

One is prompted to ask, on reading the title of this book, "Can there be *strategy* in *fighting*?" "Fighting," as opposed to "warfare," implies contact, and contact implies tactics. The author himself is evidently not too happy over his choice of titles, for he goes to some length in explaining that he uses the word "strategy" in its etymological and not in its technical sense. He distinguishes between the strategy and tactics of air fighting as follows: "Strategy guides the pilot's actions when he sees his opponent as a speck in the distance; tactics guide his actions when the machines are manoeuvring close together." But, even so, one has only to visualise air operations between forces whose bases are separated by 100 miles of sea, or a war in which aircraft are carried to a distant theatre of operations in the ships from which they will operate, to realise how impossible it would be to apply universally the author's theories of "strategy."

In point of fact the book is a treatise on the principles of leadership and tactics evolved by the most successful fighting pilots in 1916-1917, and it may be of some value as a historical record, though the style is somewhat too heavy and dogmatic to commend it to any save the most conscientious student.

Although the study of past wars is an essential part of the process of acquiring the military art, there can be no greater mistake than to base a doctrine on the tactical methods which happened to suit one particular campaign. Especially is it difficult to formulate rules for air war based entirely on the methods employed in France ten years ago.

Major Stewart's book gives a clear analysis of the methods by which the enemy could be out-maneuvred and out-witted on the Western Front, but he

makes a serious error if he imagines, as he apparently does, that the principles then so successful will be of equal value in the next war.

It is not that the author fails to appreciate the possibilities of technical progress; on the contrary, in his visions of the future he sees aeroplanes flying at 60,000 feet, and diving 800 miles an hour. What he does apparently fail to realise is that superiority in the air is, and always will be, a means to an end, not an end in itself, and that the method of obtaining it will to a great extent depend on factors that will not be the same in any two campaigns. For instance, in future it is probable that the chief role of the single-seater fighter will consist in preventing enemy bombers reaching their objective, and not, to the same extent as in 1916-1917, in keeping the air clear to enable our Army to fulfil its functions.

Again, in advocating the necessity of fighter escorts for bombing formations, the difference of air endurance between the two types is ignored, while the practicability of "stalking" the enemy in the air for half an hour or more must be regarded as extremely doubtful when it is a question of minutes if fighters can reach fighting height or not before the bombs are dropped.

When the author turns to the actual combat, a clear and useful analysis is made of the various tactics that can be adopted, and any fighting pilot who practises all the manoeuvres indicated will considerably benefit in the process. If he compares them in the air with those given in official manuals, and with what his own predilections dictate, he will benefit still more, and will be the better prepared for the day when bullets take the place of films in his guns.

Cases have been known where fighting pilots do not study official books; perhaps these may be induced to read a private book, which in the sphere of air tactics should prove of a certain value.

REGIMENTAL HISTORIES.

Record of the 4th Royal Irish Dragoon Guards in the Great War, 1914-1918. By the Rev. Harold Gibb. 8vo. (Canterbury.)

This little book, an admirable compendium of the services of a distinguished cavalry regiment, is also a testimony to the patience and courage of one of its subalterns in the person of the author, who lost his eyesight as the result of a wound.

The 4th Dragoon Guards can claim as its own two unique episodes of the early stages of the war; Corporal Thomas, of "C" Squadron, fired the first shot of the British Army, and Major Bridges is the hero of the "toy band" inspiration which stirred into life so many exhausted stragglers during the retreat from Mons. These, and the affair at Audregnies, are described in the detail they deserve. The appendices include biographical notes of the officers and a complete Roll of Honour.

The Scots Guards in the Great War, 1914-1918. By F. Loraine Petre. (John Murray.)

The first battalion of the Regiment went overseas with the British Expeditionary Force in the 4th (Guards) Brigade of the 2nd Division; the 2nd Battalion was in the 7th Division; and both joined the Guards Division when it was formed in August, 1914. Thus the war history of the Scots Guards covers the whole period of hostilities on the Western Front, and there were few battles of note in which the Regiment did not figure. The volume presents a well-proportioned and reasonably full narrative of the Scots Guards, in and out of action.

A History of the Black Watch in the Great War, 1914-18. Vol. I.—Regular Army. Edited by Major-General A. G. Wauchope, C.B. (The Medici Society).

The war history of the Black Watch is admirably planned. It is to be completed in three volumes, one for the Regular, one for the Territorial, and one for the Service Battalions. This, the first of them, follows the fortunes of the 1st Battalion, which served with the 1st Division on the Western Front from Mons to the Armistice; and of the 2nd Battalion, which came to France with the Meerut Division, and afterwards fought in Mesopotamia and in Palestine. The several contributors have done their work well, whilst the appendices are unusually complete and of great regimental interest.

The 1st King George's Own Gurkha Rifles. By F. Loraine Petre, O.B.E. 4to. (R.U.S.I., London).

This history was compiled by the late Mr. F. Loraine Petre, O.B.E., a well-known writer on historical subjects, who lived a considerable part of his life in India.

The history covers the period from the time the Regiment was raised in 1815 until 1921, and tells the story of the Regiment from those eventful years, during which it saw service at the Siege of Bhurtpore, the Sikh Wars, the Mutiny, the Afghan Wars, and during the late war served in France, Mesopotamia and Palestine.

There are seven useful appendices, which include a list of Officers, the various titles of the Regiment, its establishment from the time of being formed, and one on the colours, uniform and equipment.

The book is well illustrated, and has good maps, but it is of rather an ungainly size.

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- WELLINGTON. By the Hon. J. Fortescue. 10s. 6d. 8vo. London, 1925.
- THE ROMANCE OF SOLDIERING AND SPORT. By General Sir J. Willcocks, G.C.B. 25s. 8vo. London, 1925.
- A HISTORY OF THE TRANSPORT SERVICES OF THE EGYPTIAN EXPEDITIONARY FORCE, 1916-18. By Bt. Lieut.-Colonel G. E. Badcock, C.B.E., D.S.O. 21s. 8vo. London, 1925.
- THE STRATEGY AND TACTICS OF AIR FIGHTING. By Major O. Stewart, M.C., A.F.C. 6s. 8vo. (Longmans Green & Co.) London, 1925. (Presented by the Publishers.)
- MEMORIALS OF SERGEANT W. MARJOURAM, R.A., INCLUDING SIX YEARS' SERVICE IN NEW ZEALAND DURING THE LATE MAORI WAR. Edited by Sergeant W. White. 8vo. London, 1861.
- PERSONALITIES AND REMINISCENCES OF THE WAR. By Major-General Lee Bullard. 25s. 8vo. New York, 1925.
- HISTORY OF THE GREAT WAR. Based on Official Documents. "Veterinary Services." Edited by Major-General Sir C. J. Blenkinsop, K.C.B., D.S.O., and Lieut.-Colonel J. W. Rainey, C.B.E. 21s. 8vo. (H.M. Stationery Office). 1925. (Presented by the Publishers.)
- THE OXFORDSHIRE AND BUCKINGHAMSHIRE LIGHT INFANTRY CHRONICLE, 1924. Edited by Colonel J. F. C. Fuller, D.S.O. 8vo. (Eyre & Spottiswoode, Ltd.) London, 1925. (Presented by the Editorial Committee.)
- MEMOIRS OF FIELD-MARSHAL LORD GRENFELL, P.C., G.C.B., G.C.M.G., etc. Illustrations. 21s. 8vo. (Hodder & Stoughton.) London, 1925. (Presented by the Publishers.)
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- IN THE HEART OF ASIA. By Lieut.-Colonel P. T. Etherton. 16s. 8vo. London, 1925.
- HISTORICAL ILLUSTRATIONS TO FIELD SERVICE REGULATIONS. Vol. II. By Brevet-Major H. G. Eady, M.C. Maps. 10s. 6d. 8vo. (Sifton Praed & Co., Ltd.) London, 1926. (Presented by the Publishers.)
- COMMON MISTAKES IN THE SOLUTION OF TACTICAL PROBLEMS AND HOW TO AVOID THEM. By Lieut.-Colonel A. B. Beauman, D.S.O., p.s.c. 2s. 6d. 8vo. London, 1925.

- PRACTICAL CO-OPERATION BETWEEN THE SERVICES. By Captain E. Altham, C.B., R.N. (Extract from "The Fighting Forces," December, 1925.) 8vo. N.P. 1925. (Presented by the author.)
- MEMOIRS OF WILLIAM HICKEY. Vol. IV. (1790-1809). Edited by A. Spencer. 21s. 8vo. London, 1924.
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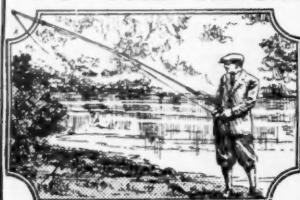
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- THE 3RD KING'S OWN HUSSARS IN THE GREAT WAR, 1914-1919. By Lieut.-Colonel W. T. Willcox, C.M.G. 18s. 8vo. (John Murray.) London, 1925. (Presented by the Publishers.)
- HISTORY OF THE BLACK WATCH (ROYAL HIGHLANDERS) IN THE GREAT WAR, 1914-1918. By Major-General A. G. Wauchope, C.B. 8vo. (The Medici Society). 1925. (Presented by the Author.)
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- THE 1ST KING GEORGE'S OWN GURKHA RIFLES (THE MALAUN REGIMENT). By F. L. Petre, O.B.E. Illustrations and maps. 4to. (Royal United Service Institution.) London, 1925. (Presented by Lieut.-Colonel H. Holderness, D.S.O., 1st K. G. O. Gurkha Rifles.)

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